THE IRON TRADE REVIEW

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THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

Quietness even greater and more general than in the waiting period of the past nine months has settled upon the pig iron market since the announcement of lower prices by Southern furnaces. Buyers agree that the market has now turned in their favor and it will take time to demonstrate whether they will get the further reductions in price now expected. The establishing of a basis $1 a ton lower at the furnace on iron for the Eastern market than for Central and Western shipments, is an announcement that in the opinion of Southern furnacemen sufficient iron can now be produced at home to make imports unnecessary and is a distinct bid for business which has heretofore gone abroad by force of the domestic situation. There are furnaces outside the Southern association now quoting $17 at furnace for No. 2 foundry, and Central Western buyers already argue that the $16.50 basis should apply to them as well as to the East. A situation is created in which competition between Northern and Southern producers will naturally be more keen and the former are not expected to let go readily of the business they have had in a period in which Southern irons have been higher than Northern in central territory. An immediate result of the announcement of last week has been to reduce the prices asked for shipments of foundry iron in the second quarter, and in some cases they are now practically the same as for delivery through the second half of the year. Offerings of Southern gray forge have been made at $19.85, Pittsburg, for the last half, but without contracts as yet. Chicago reports 6,000 tons of malleable and standard Bessemer sold on the basis of $21.75 for the former. The situation in steel-making pig irons is unchanged. Much more has been done in these irons in recent weeks than in foundry and forge. In the matter of the steel corporation's contracts for Bessemer iron an interesting development is the decision of certain Valley furnace companies to ship to the corporation only such iron as is made from corporation coke. Some of the merchant furnaces, because of the coke shortage, have been compelled to buy in the market at high prices. The delivery of iron on low priced contracts only as fast as low priced coke is available, will extend deliveries of steel corporation iron bought for first quarter as late as July, and in some cases, August. The blast furnace workers have voted against pressing the 8-hour day but will demand an advance in wages May 1. The demand for finished material continues to contrast with pig iron. On the books of the steel corporation the tonnage is over 5,400,000 tons. Structural demand is strong; but the strike of workers expected on May 1, promises serious derangement in architectural and bridge work, and the effect of such a stoppage would be far-reaching. An order for 2,000 steel cars just placed by the C. B. & Q. Road, represents more than 20,000 tons of steel shapes. In the week the American Bridge Co. took heavy orders, including 20,000 tons for the new tube works at McKeesport and Lorain. Plate manufacturers made no change in prices at their meeting in New York last week. Eastern mills are still getting a good margin above the Western parity, but the largest Western mills are filled up for months ahead. The steel bar association met at Pittsburg, on Tuesday, and reaffirmed prices. The concssions wanted by large buyers, who are ready to contract for a year from July 1, are still refused. The rail mills report a steady run of new orders, and one Western road has asked prices on its needs of next spring.

PITTSBURG.

OFFICE OF *The Iron Trade Review*, 429 PARK BUILDING, April 8.

The reductions announced by the Southern furnace operators, on foundry and forge irons, have had a demoralizing effect on the pig iron market, and large melters, who contemplated buying shortly for second half delivery, have postponed closing contracts in anticipation of still further reductions, not only by the furnaces in the South, but those in the North as well. The heavy offerings of Southern gray forge for delivery the last half at $19.85, Pittsburg, are not tempting the large rolling mills, and fair sized lots for early delivery at $20.25 find no buyers. Despite these reductions, the Northern operators are holding their prices firmly, and No. 2 foundry for last half delivery is quoted at from $21.25 to $22.85, Pittsburg. It is true that there has been some buying for this delivery by some of the foundrymen in this district, but at prices somewhat below those now quoted. Another thing that is preventing the purchase of foundry iron for second half delivery relates to the sale of castings for the second half. Few of the large foundries in this territory have sold their product into the second half, and until their output is better sold up they will not be interested in buying iron at any price.

Some of the merchant furnaces in the valleys that contracted last fall to furnish the United States Steel Corporation with Bessemer iron, for six months from October to April 1, at $16.50 at the furnace, have taken the stand that they will deliver the iron in accordance with their receipts of coke from the H. C. Frick Coke Co., ton for ton, and that they cannot be expected to deliver iron made from coke bought in the open market at the high prices that have been prevailing the last six months, at $16.50 per ton. Coke was to have been furnished for the production of this iron at $2.25 per ton, but as the furnaces rarely received more than one shipment of coke per week, they were compelled to secure coke in the open market at prices ranging from $5 to $7 per ton. As a result of this the steel corporation cannot receive the entire tonnage contracted for the first quarter before July, and some shipments may run into August. Shipments of coke to these furnaces by the H. C. Frick Coke Co. have been much better during the past two weeks than during any period in the last six months, and all indications point to still further improvement in shipments.

A meeting of the steel bar manufacturers was held in this city yesterday and prevailing quotations were reaffirmed. All the concerns represented reported heavy specifications and numerous inquiries from agricultural implement manufacturers. A meeting of the shafting manufacturers is scheduled for today at Washington, D. C. This is a quarterly meeting and conditions will be carefully canvassed. New business has been very satisfactory, however, since the first of the year, so that prevailing discounts will remain unchanged. At the meeting of the steel plate manufacturers held in New York last Thursday, prevailing quotations were reaffirmed. No changes were made in delivered prices, although it was believed that something of this kind would be done, in view

of changes in freights. Since the last delivered prices were prepared the rate from Pittsburg to New York was reduced from 18 cents to 13 cents, and recently advanced to 14 cents, but the New York delivered price continues 1.78c. The delivered price at Chicago is 1.75c despite the tariff of 16½c which would make the delivered price 1.76½c.

PIG IRON.—Not for many months has the pig iron market been as quiet as during the past week. With the exception of buying of small lots for early delivery little iron changed hands, and there is no indication that there will be heavy buying in the near future. No. 2 foundry iron for prompt shipment is being offered at lower prices, one sale of 300 tons having been made at $22.85, Pittsburg. Foreign iron continues to be offered at $21.50 to $21.75 in carload lots, despite the recent advances in the foreign market. There has been no buying for future delivery during the week, and the buying movement will not again set in until the foundrymen are absolutely certain that prices have settled. Bessemer iron for second half delivery is being offered at $20 at the furnace and it has been hinted that on a large tonnage a slightly better price would be named by some of the furnaces. On May 1, the blast furnace workers in the valleys will demand an increase in wages, but inasmuch as the new scale has not yet been presented the furnace operators have taken no action whatever. We revise quotations as follows:

Bessemer, Valley	$21 00 to 21 50
Bessemer, Pittsburg	21 85 to 22 35
No. 1 Foundry	23 25 to 23 75
No. 2 Foundry	22 25 to 22 75
Gray Forge, Pittsburg	20 60 to 20 85
Chilled Basic, Valley	21 00 to 21 50
Chilled Basic, Pittsburg	21 85 to 22 35

STEEL.—The buying of both Bessemer and open-hearth billets has been limited to small lots during the week and one sale of a small lot of Bessemer billets has been reported at $30.50, which is one dollar under the price paid for a large lot last week. Open-hearth billets are firm at prices ranging from $31.50 upwards, according to the carbon. Bessemer rods are held at $36 to $36.50 and open-hearth at $37 to $37.50.

FERRO-MANGANESE.—There is little manganese changing hands and the sales that are being made are confined to small lots. English ferro is being offered at $50 in carload lots, delivered at buyer's mill, and $52.50 for less than carload lots.

SPELTER.—The spelter market continues to advance and prime Western grades are held at 5.55c to 5.57½c Pittsburg.

MUCK BAR.—We note the sale of 2,000 tons of muck bar for early delivery at $35.50, Pittsburg. Smaller lots have sold during the week at $35.75.

SKELP.—Very little skelp for delivery to July 1 is being offered, and the small lots that find their way into the market from time to time find ready buyers. Steel skelp is quoted at 2.05c while iron is held at 2.10c to 2.15c.

PLATES.—At the meeting of the plate manufacturers held last week the mills represented without exception reported that the tonnage now carried is larger than in the history of the trade. While the Eastern mills are quoting $6 a ton above the quotations of the Western mills, the latter are not formidable competitors, being unable to make deliveries as stipulated. No changes were made in agreed quotations which are as follows: Tank plates, ¼-inch thick and up to 100 inches in width, 1.60c at mill, Pittsburg; flange and boiler steel, 1.75c; marine, ordinary firebox, A. B. M. A. specifications, 1.80c; still bottom steel, 1.80c; locomotive firebox, not less than 2.10c, and it ranges in price to 3c. Plate more than 100 inches, 5c extra 100 pounds. Plate 3-16 of an inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra. These quotations are based on carload lots, with 5c extra a hundred pounds for less than carload lots. Terms, net cash, in 30 days.

BARS.—At the meeting of the steel bar manufacturers held here yesterday prevailing quotations were reaffirmed. Specifications are heavy and current demand is good. Large agricultural inquiries are pending. We quote as follows: Bessemer steel bars, 1.60c; open-hearth, 1.70c; plow beams and cultivator beams, 1.60c, net; channels, angles, zees and tees, Bessemer under 3 inches, 1.70c; over 3 inches, 1.80c; bar iron, 1.80c to 1.85c, Youngstown, or 1.84¾c to 1.89¾c, Pittsburg, with freight added to point of delivery from Youngstown. Hoops and bands are quoted at 1.90c, full extras, in 250-ton lots and over, and 2c in less than 250-ton lots.

RAILS AND TRACK MATERIAL.—The Carnegie Steel Co. last week secured an order from a traction line for 7,000 tons of rails and other large orders from the same sources are pending. The light rail market is firm and prevailing quotations are being maintained. We quote as follows: Standard sections, 50 pounds and over, in lots of 500 tons and over, $28; car lots and less than 500 tons, $30; less than car lots, $32; light rails, 8 pounds in carload lots, $39; less than carload lots, $40; 12, 16 and 20 pounds, $36; 25 to 40 pounds, $36. Track materials: Spikes, 2.15c to 2.25c; track bolts, square heads, 2.05c; hexagon heads, 2.65c; fish plates, 1.60c on orders accompanying large rail contracts, otherwise 2c to 2.10c is asked.

STRUCTURAL MATERIAL.—All indications now point to an almost complete tie up of all structural work on May 1, on account of the arbitrary demands made by the structural workers. Nothing looking towards a settlement of the trouble between the structural workers and the American Bridge Co. was done during the week and it is doubtful if any peace conferences will be held in the near future. Demand for structural material is excellent, another new building projected for erection here requiring about 1,500 tons of material. Light angles continue to be sold at premiums of $8 and $10 per ton for early delivery. Agreement quotations are as follows: Beams and channels, 3 to 15 inches, 1.60c; 18 to 24 inches, 1.70c; tees, 1.65c; zees, 1.60c; angles from 3 to 16 inches, 1.60c; universal mill plates, 1.60c.

PIPES AND TUBES.—It is reported that two of the larger independent pipe mills have negotiations on for a consolidation which will be announced at an early date. The project to combine four of the largest independent mills has fallen through entirely. The demand for material is beyond the capacity of the mills and small premiums are being paid for early shipment. Discounts in carload lots, plus the freight to destination, as follows:

MERCHANT PIPE.

	Steel		Wrought Iron	
	Black Percent.	Galv. Percent.	Black Percent.	Galv. Percent.
⅛, ¼ and ⅜ inch	68	58	65	55
½ inch	70	60	67	57
¾ to 6 inch	75	65	72	62
7 to 12 inch	69	59	66	56
Plugged and Reamed				
1 to 4 inch	73	63	70	60
Cut 3 to 6 feet				
⅛, ¼ and ⅜ inch	63	52	60	49
½ inch	65	54	62	51
¾ to 6 inch	71	60	68	57
7 to 12 inch	65	53	61	50
Cut 6 feet and longer				
⅛, ¼ and ⅜ inch	64	53	61	50
½ inch	66	55	63	52
¾ to 6 inch	72	61	69	58
7 to 12 inch	66	54	62	51
Extra Strong Plain End				
⅛ to 8 inch	67	57	63	53

Threads only—Same as Plain End, plus 1¼ percent net.
Threads and Couplings—Same as Plain End, plus 2½ percent net.

Double Extra Strong Plain End				
½ to 8 inch	59	49	55	45

Threads only—Same as Plain End, plus 2 percent net.
Threads and Couplings—Same as Plain End, plus 3 percent net.

NOTE: Orders for less than carload will be charged at 12½ percent advance. Extra and Double Extra Strong Cut Lengths, lower random discounts by 10 percent net for 6 feet and longer, and 15 percent net for 3 to 6 feet.

BOILER TUBES.

Steel.

	Percent.
1 to 1½ inches	45
2¼ to 5 inches	62½
1¾ to 2¼ and 6 to 13 inches	59½

Iron.

	Percent.
1 to 1½ inches	36½
2¼ to 5 inches	45½
1¾ to 2¼ and 6 to 13 inches	35½

CASING.

	S. and S. Percent.
2 to 3 inches	58
3¼ to 4 inches	60
4¼ to 12½ inches	63

SHEETS.—The demand for sheets continues exceptionally strong and the general situation is excellent. Independent mills are securing from 2.85c to 2.90c for early deliveries of No. 28 and considerable business is being booked for future delivery by the outside mills. Quotations of the American Sheet Steel Co. in 500 bundle lots and over are as follows: No. 28, 2.75c; No. 27, 2.65c; No. 26, 2.55c; Nos. 22 and 24, 2.45c; Nos. 18 and 20, 2.35c; Nos. 14 and 16, 2.25c; Nos. 10

and 12, 2.10c to 2.15c. Galvanized: No. 16, 2.60c; No. 18, 2.85c; No. 26, 3.35c; No. 27, 3.60c; No. 28, 3.85c; No. 29, 4.35c; No. 30, 4.50c.

WIRE AND WIRE NAILS.—The market continues very strong and prices remain practically unchanged. We quote: Wire nails, carload lots, to jobbers, f. o. b. cars, Pittsburg, $2.00; plain wire, carload lots, $1.90; barb wire, carload lots, $2.30; staples, carload lots, $2.20. Galvanizing, 30 cents extra. Carload lots to retailers are held at 5 cents advance in all lines, and on less than carload lots a further advance of 10 cents is charged. Steel cut nails are quoted as follows: Carload lots, $2.15, and less than carload lots, $2.20, f. o. b. Pittsburg, plus freight to point of destination. Iron cut nails are $2.25 in carload lots and $2.30 in less than carload lots. Terms, 60 days, less 2 percent off in 10 days.

MERCHANT STEEL.—A meeting of the shafting manufacturers is being held today at Washington, D. C., for the purpose of reviewing the general situation, but it is not probable that prices will be changed. The tonnage that has been booked since the first of the year is very large and all of the mills have as much as they can do. We quote: Turned cold rolled and ground shafting, 47 off in carload lots and 42 percent off in less than carload lots; tire steel, 2.15c to 2.25c; spring steel, 2.25c to 2.35c; toe calk, 2.30c to 2.40c. The following differentials maintain: Less than 2,000 pounds of a size and not less than 1,000 pounds, 10 cents advance; less than 1,000 pounds of a size, 30 cents advance. Tool steel is quoted 7 cents and upwards, according to the grade.

OLD MATERIAL.—Foundries are not purchasing scrap for future delivery and as a result prices on cast scrap are somewhat easier. Good grades of heavy melting stock, however, are very strong and the market is very firm. We quote, gross tons, as follows: Heavy melting stock, $21.50 to $22.15; low phosphorus melting stock, $25 to $25.50; steel rails, $21 to $21.25; re-rolling rails, $22.50 to $23; No. 1 cast scrap, $19 to $19.25; borings, $11 to $11.50; busheling scrap, $17.50 to $18.50; old iron rails, $24.50 to $25; turnings, $15 to $15.50.

COKE.—While foundries are not interested in the purchase of coke for second half delivery, some of the coke producers have sent out prices ranging from $4.75 to $5 at the ovens, while extra good 72-hour Connellsville coke is quoted at $5.25. Whether these prices will hold depends upon the foundrymen entirely, as those approached consider them too high and are waiting for counter offers from the coke concerns. Coke shipments from the Connellsville region are improving and the output continues. It is estimated that the output of the Connellsville region will amount to 350,000 tons weekly, when new operations now under way are completed, increasing the annual output about 2,500,000 tons annually. For the week ending Saturday, March 28, the production of the upper region amounted to 249,986 tons and that of the lower region 50,600 tons. Furnace coke for second half delivery is held at $3.75 to $4, and foundry for prompt shipment continues to be held at prices ranging from $5.75 to $6.50.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
519 MONADNOCK BLOCK, April 7.

Instead of steadying the market, as was anticipated, the recent reduction in the price of Southern foundry grades has had quite the contrary effect. Buyers who were sounding the market freely for iron for the second and third quarters have now withdrawn and assert that they will wait a little longer. Most of the large melters are well covered for the next three months, and with furnaces making comparatively good shipments these are in position to withhold their orders for several weeks without inconvenience. A little trading has been done in iron for prompt shipment and there has been some demand for malleable and standard Bessemer for deliveries in the last half, but aside from these the market is without animation. Contracting for finished material continues without diminution, and all prices are firm. Steam and electric railroads have placed orders during the week for several thousand tons of heavy and light rails, and it is significant that one road is already making inquiry for standard sections for deliveries next spring. On this, however, mills have refused to quote. shown no disposition to make this concession. A meeting of Structural steel is moving briskly with railroads figuring on large tonnages for contemplated improvements in their maintenance of way departments. It is noteworthy that the Chicago, Burlington & Quincy has placed orders in the past week for 2,000 all-steel composite cars, 1,000 of which will be built by the Cambria Steel Co., and the remainder by the Standard Steel Car Co., of Pittsburg. These cars will be built of structural shapes and not of pressed steel material. Agricultural implement manufacturers are still placing contracts for their next season's requirements of merchant steel, particularly shapes, and there is considerable inquiry for soft steel bars from the same people. Buying of bars, however, is not of heavy proportions, the large consumers withholding their orders in the hope of securing a rebate on contracts for 10,000 tons and over, of $2.30 per ton below present quotations, at which price contracts were made last year. It is doubtful if mills will make this concession, though a meeting of the steel bar manufacturers will be held in Pittsburg this week at which this subject will be discussed. Compared with the sales of bar iron at the same time last year, trading in this material is not up to those proportions. A good tonnage, however, has been booked for deliveries extending through the year, prices varying from 1.80c to 1.90c, according to the size of order and delivery required. Sheets, plates, merchant pipe and wire products show the same active movement, demand being all that the manufacturers can supply. Scrap and coke are easier, though there is still a scarcity of material used by rolling mills.

PIG IRON.—The week was probably the quietest of the year so far as the inquiry or buying of pig iron is concerned. The cut of $1 a ton in Southern foundry grades has frightened prospective buyers from the market. The only important sale of the week was a lot of 6,000 tons of Bessemer iron, evenly divided between malleable and standard, which was purchased by a local car wheel interest. Deliveries are to commence in July at the rate of 1,000 tons a month, and the price is stated to have been less than $22 Chicago, probably $21.75. Prior to the announcement of the change in prices in Southern iron, many melters in this section had been sounding the market and talking of buying for deliveries in the second and third quarter, and some for the entire last half; but all these have withdrawn their inquiries. Some small sales have been made for quick shipment, and Southern furnaces are offering to fill orders for any delivery on the basis of $17.50 for No. 2 foundry. All other quotations have been withdrawn. We quote as follows:

Lake Superior Charcoal	$25 00 to 26 00
Local Coke Foundry No. 1	23 00 to 23 50
Local Coke Foundry No. 2	22 50 to 23 00
Local Coke Foundry No. 3	22 00 to 22 50
Local Scotch Foundry No. 1	23 50 to 24 50
Southern Coke No. 1	22 35
Southern Coke No. 2	21 85
Southern Coke No. 3	21 35
Southern Coke No. 4	20 85
Southern No. 1 soft	22 35
Southern No. 2 soft	21 85
Southern Gray Forge	19 85 to 20 35
Southern Silveries (4% to 5% silicon)	23 85
Southern Silveries (5% to 6% silicon)	24 35
Jackson Co. Silveries (6% to 8% silicon)	29 30 to 30 30
Ohio Strong Softeners	24 00 to 24 50
Alabama and Georgia Car Wheel	28 35 to 29 35
Malleable Bessemer	22 00 to 23 00
Standard Bessemer	22 50 to 23 50
Basic Iron	22 35 to 22 85

BARS.—A very fair tonnage has been placed with bar iron mills in the past week, including some good round lots, one of 5,000 tons from a carbuilder. But the buying is not as active as it was this time a year ago, and manufacturers attribute this to the fear of strikes and to the fact that since steel has been selling so much lower than iron, many concerns who have heretofore used only the latter product, have since learned to substitute steel. In good sized contracts, common bar iron is being sold on the basis of 1.80c Chicago, though on smaller orders $1 to $2 a ton more is asked. While the inquiry for steel from implement concerns on this year's requirements is heavy, only a small proportion of them have placed their contracts, the larger ones holding out for a possible rebate from present prices. It is stated that they are seeking to place their contracts for the year commencing July next on the same basis as last year, which was at $2.30 per ton less than present quotations, but so far mills have

the steel bar manufacturers is being held in Pittsburg today, and it is expected that some definite statement will result from it. We quote mill shipments, Chicago delivery, as follows: Bessemer steel, 1.76½c; angles, less than 3x3, 1.86½c base; hoops, in lots of 250 tons and greater, 2.06½c; less than this amount, 2.16½c; iron, 1.80c to 1.90c. Store prices are as follows: Steel, 2c to 2.10c; iron, 2.15c to 2.20c; hoops, 2.40c to 2.50c; angles, 2.25c rates.

SHEETS.—The market continues firm, buying being of good proportions. Inquiry covers equally both black and galvanized sheets, all gauges being in demand. Independent mills are reported to be shading the quotations given below. We quote mill shipments, carload lots, Chicago delivery: Black sheets, No. 27, 2.86½c to 2.91½c; No. 28, 2.96½c to 3.01½c. Galvanized, 75 and 5 percent. On lots from store, we quote No. 27 black, 2.95c to 3c; No. 28, 3.05c to 3.10c. Galvanized, 75 and 2½ percent.

STRUCTURAL STEEL.—There has been a good demand for shapes in lots below 1,000 tons. An order was placed by the Chicago, Burlington & Quincy Railroad last week for 2,000 steel cars to be built out of structural shapes. The Cambria Steel Co. secured 1,000 of them, and the Standard Steel Car Co., of Pittsburg, the balance. Several railroads are figuring on large tonnages for improvements in their maintenance of ways departments, and contracts are expected to be placed in the near future. Store trade is active. We quote mill prices, Chicago delivery: Beams and channels, 16 inches and under, 1.75c to 2c; 18 inches and over, 1.85c to 2.10c; universal plates, 1.90c to 2.10c; angles, 3x3 and larger, 1.75c to 2c; tees, 3x3 and larger, 1.80c to 1.90c; zees, 1.75c to 1.95c. The maximum quotations are asked by mills and dealers on lots for quick shipment. Lots from store, 2¼c to 2½c per pound.

PLATES.—The demand is without diminution and prices are very firm. We have advanced our quotations to meet the prices asked by manufacturers and jobbers able to give delivery; the base price of 1.75c is unchanged, though material cannot be bought at it. We quote mill shipments, Chicago delivery: Tank steel, ¼-inch and heavier, 1.90c to 2c; flange steel, 2c to 2.10c. Prices for lots from stock: Tank steel, ¼-inch and heavier, 2.15c to 2.25c; 3-16, 2.25c to 2.35c; No. 8, 2.30c to 2.40c; No. 10, 2.35c to 2.45c; flange steel, 2.40c to 2.50c.

RAILS AND TRACK SUPPLIES.—Orders continue to be accepted by mills from steam and electrical roads for both heavy and light sections, and the tonnage closed during the week aggregates several thousand tons. It is worthy of special mention that a Western road sought to place an order last week for heavy rails for delivery next spring, but the mills refused to accept it. We quote standard sections, 500 tons and over, $28; less than 500 tons to carload lots, $30; less than carload lots $32; light rails, 45 pounds, $34 to $35; 12 pounds, $39 to $40, with regular differentials for intermediate sizes. Track supplies, mill shipments: Angle bars, 2c to 2.10c; spikes, first quality, 2.25c (out of store, carload lots, 2.35c to 2.45c rates); second quality, 2.10c; track bolts, 3½x¾, with square nuts, 2.85c to 3c per 100 pounds; with hexagon nuts, 3.05c to 3.15c, with usual differentials for other sizes.

MERCHANT STEEL.—Agricultural implement manufacturers are still placing contracts for their next season's requirements, but the buying is not general. Heavy inquiries are now being received, and it is anticipated that the buying movement will commence in earnest shortly. We quote mill shipments, Chicago delivery, as follows: Spring steel, 2.65c to 2.75c; sleigh shoe, 1.95c flat sizes; concave and convex, 2c; out of store, 2.15c; cutter shoe, 2.50c to 2.60c; machinery steel, 2.15c to 2.25c base; plow steel, 2.50c and upwards, according to quality; toe calk, 2.30c to 2.40c; out of stock, 3c to 3.10c; ordinary tool steel, 6c to 7c; specials, 13c and upwards; less than carload lots, 5 to 10 percent higher; cold rolled shafting, carload lots, 47 percent off; less than carload lots, 42 percent off.

MERCHANT PIPE.—Mills and jobbers report that new business is all that can be expected. The fear of labor troubles among plumbers and the building trades has been banished by the ratification of satisfactory agreements between employers and workmen, and the outlook for a good trade in this material is bright. We quote prices on carload lots, mill shipments random lengths, f. o. b. Chicago, as follows:

	Steel Pipe.		Guaranteed Wrought Iron Pipe.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛ to ¾ in inclusive	66.35	56.35	63.35	53.35
½ inch	68.35	58.35	65.35	55.35
7 to 12 inches, inclusive	67.35	57.35	64.35	54.35

Less than carload lots, 12½ percent advance over above prices.

BOILER TUBES.—Mills and jobbers report that there is a good demand and that prices are firm. The following are quotations on carload lots, mill shipments, f. o. b. Chicago. On less than carload lots from mill, 12½ percent is to be added:

	L. W. Steel Percent.	C. C. Iron Percent.
1 to 1½ in	43.35	38.35
1¾ to 2½ in	55.85	35.85
2¾ to 5 in	60.85	45.85
6 to 13 in	55.85	35.85

For lots direct from warehouse stock:

	L. W. Steel Percent.	C. C. Iron Percent.
1 to 1½ in	40	35
1¾ to 2½ in	50	32½
2¾ to 5 in	57½	42½
6 to 13 in	50	32½

CAST IRON PIPE.—Inquiries have been received from several municipalities and other large consumers for round lots, but actual buying is of small proportions. We quote f. o. b. Chicago, 4-inch water pipe, $34; 6-inch, $33; 8-inch and upwards, $32; gas pipe, $1 a ton higher.

BILLETS AND WIRE RODS.—The market has been quiet and no sales of either are reported. We quote wire rods (the last sale) $40; open-hearth billets, for use in rolling mills, $33; open-hearth billets for forging purposes, $36; open-hearth billets from store, 1.80c; German basic Bessemer billets, $32.50.

WIRE AND WIRE NAILS.—There is no diminution in the heavy demand for wire products of all kinds that has been felt in the local market for several weeks. Stocks in warehouses are very low, and dealers are pressing mills for prompt shipments. We quote prices to jobbers, Chicago delivery, as follows: Wire nails, carload lots, $2.20; less than carload lots, $2.30. Cut nails, steel, carload lots, $2.26½; less than carload lots, $2.36½. Plain wire, $2.10 carloads, and $2.20 in smaller lots; galvanized, carloads, $2.40; smaller lots, $2.50. Barbed wire, carloads, $2.50; less than carloads, $2.60; galvanized, carloads, $2.80; less than carloads, $2.90. Staples, carloads, $2.30; smaller lots, $2.40; galvanized, carloads, $2.60; smaller lots, $2.70. Bale ties, 85 percent discount f. o. b. Waukegan on straight carload lots. Poultry netting, 85 and 5 percent discount from list f. o. b. Joliet or DeKalb, with actual freight allowed not exceeding 50 cents per 100 pounds.

COKE.—The local market continues to improve, due to the arrival of larger consignments from eastern and southern coke ovens. Railroads are gradually improving their facilities, and not much complaint is to be heard on the score of delayed shipments. Connellsville coke is quoted at $8.50 to $8.75, spot track, Chicago; Southern coke, $8.50 to $9.

OLD MATERIAL.—The market is growing in strength, there being a good demand all along the line. Country dealers are shipping material in freely, though there is a scarcity of busheling and cast scrap. It is probable that an advance of 25 cents to 50 cents will be made this week on the quotations given below. We quote gross tons as follows:

Old iron rails	$23 50 to 24 00
Old steel rails (mixed lengths)	18 00 to 18 50
Old steel rails (long lengths)	21 50 to 22 00
Relaying rails	31 50 to 32 00
Old wheels	23 00 to 23 50
Heavy melting steel	17 00 to 17 50
Mixed country steel	15 00 to 15 50

The following are selling prices per net ton:

No. 1 R. R. wrought	$19 50 to 20 00
No. 2 R. R. wrought	18 00 to 18 50
Shafting	19 00 to 19 50
Dealers' forge No. 1	16 50 to 17 00
No. 1 busheling and wrought pipe	14 00 to 14 50
No. 1 cast	17 00 to 17 50
Railway malleable	15 50 to 16 00
Country malleable	15 00 to 15 50
Iron axles	23 50 to 24 00
Steel axles	19 50 to 20 00
Cast borings	10 00 to 10 50
Mixed borings, etc	9 50 to 10 00
Wrought turnings	13 50 to 14 00
Machine shop turnings	13 50 to 14 00
Iron axle turnings	14 00 to 14 50
Steel axle turnings	13 50 to 14 00
Stove plate and light cast scrap	13 00 to 13 50
Old iron splice bars	21 00 to 21 50

The product of the Pioneer furnaces of the Republic Iron & Steel Co., at Thomas, Ala., which has been sold through

M. A. Hanna & Co., will hereafter be marketed through the general sales office of the Republic Iron & Steel Co., in this city.

CLEVELAND.

OFFICE OF *The Iron Trade Review*, 1064 ROSE BUILDING, April 8.

All controversies as to wages of vessel employes, except firemen and oilers, have now been adjusted. The firemen have refused to go to work unless their demands are complied with, but they are not supported by the engineers and other union employes and it seems probable that a settlement will soon be made or that non-union firemen will be employed. Vesselmen are not, however, anxious for navigation to open and it is not probable that much ore will be shipped this month. In that event, the docks on Lake Erie will be in fairly good condition by May 1. Orders from furnaces for ore being freely given, and a fair amount of ore is being moved to the furnaces, but there is complaint that railroads are not supplying as many cars as are needed. Rates of freight on ores have not yet been fixed. The Great Northern R. R. has made a contract for carrying rails from Lake Erie ports to the head of the lakes at 95 cents, which is an advance of only 5 cents over last year, and it is very doubtful if the advance on ore freights will be more than 5 cents, which would give a rate of 80 cents to Duluth.

PIG IRON.—There is a lull in the market which is attributed to the action of the Southern association furnaces in reducing prices, as noted in these columns last week, to $17.50 Birmingham for No. 2 foundry for the last half. Just before the announcement of the Southern association, inquiries were coming in freely and sales agents were encouraged to believe that the long delayed period of buying was about to set in, but buyers are now showing a disposition to await further developments. There has been no change in quotations of northern iron and furnacemen say very emphatically that there will not be, as Northern conditions are very different from those in the South. No notable sales of Southern iron for consumption in this district are reported. The usual figure for spot iron is on a basis of $23 for No. 2 Northern foundry, Cleveland delivery. Gray forge for the third quarter sells at $20 at the furnace. We quote as follows, f. o. b. Cleveland, for shipments in the second quarter of 1903:

Bessemer	$21 85 to 22 35
No. 1 Strong Foundry	22 50 to 23 00
No. 2 Strong Foundry	22 00 to 22 50
No. 3 Foundry	21 25 to 21 75
Scotch No. 1	22 75 to 23 00
Scotch No. 2	22 25 to 22 50
Gray Forge, Valley	20 00 to 20 25
Lake Superior charcoal	24 00 to 25 00

FINISHED MATERIAL.—Although there is no great rush of orders, reports from mills indicate an unusually large product, which is being covered by a steady flow of orders. Jobbers report that, while business seems a little quiet, because there are no extraordinary features, the orders foot up more than those of last year. Deliveries are more prompt, the mills being pretty well up to orders on everything except plates. Some apprehension still exists as to strikes, but the labor situation, it is believed, will clear up satisfactorily. Sales of bar iron at the usual quotation, 1.80c Youngstown, are not numerous. Agricultural interests are not placing orders for the steel bars which they will need, but they are expected to make contracts very soon after the meeting of the steel bar association this week. A good business has been done in agricultural shapes and merchant steel, however, several season contracts having been closed. The price for steel bars continues at 1.60c for Bessemer and 1.70c for open-hearth, Pittsburg. Agreement quotations on structural material are as follows: Beams and channels, 3 to 15 inches, 1.70c; 18 to 24 inches, 1.80c; tees, 1.75c; zees, 1.70c; angles from 3 to 6 inches, 1.70c; universal plates, 1.70c. There is a very fair demand for sheets. The announced prices of the principal producer for sales through jobbers are as follows: Galvanized sheets, mill sales, carload lots, Nos. 10 and 11, 2.60c; Nos. 12-14, 2.70c; Nos. 18 to 21, 3c; Nos. 22 to 24, 3.20c; Nos. 25 and 26, 3.55c; No. 27, 3.80c; No. 28, 4.05c; No. 29, 4.45c; No. 30, 4.95c. Galvanized sheets out of stock are quoted 75 and 5 off, For 3-16-inch black sheets and heavier we quote 2.15c, Cleveland. Mill sales of black sheets to consumers are made on the following basis: No. 24, 2.65c to 2.75c; No. 26, 2.75c to 2.85c; No. 27, 2.85c to 2.95c. The following are prices out of stock: No. 10, 2.35c to 2.50c; No. 12, 2.45c to 2.60c; No. 14, 2.50c to 2.60c; No. 16, 2.60c to 2.70c; Nos. 18-20, 2.75c to 2.85c; Nos. 22-24, 2.85c to 2.95c; Nos. 25-26, 2.95c to 3.05c; No. 27, 3.05c to 3.15c; No. 28, 3.15c to 3.25c.

OLD MATERIAL.—There is a strong demand for heavy steel from the Pittsburg district and prices are about 50 cents higher. Old rails are scarce and $1 higher. We quote f. o. b. Cleveland, gross tons:

Old iron rails	$26 00 to 27 00
Old steel rails (over 6 feet)	33 00 to 33 00
Old steel rails (6 feet and under)	20 50 to 21 00
Old car wheels	24 50 to 25 00
No. 1 R. R. wrought scrap	22 00 to 22 50
Mill scrap	19 00 to 19 50
No. 1 machine cast scrap	21 00 to 21 50
Iron axles	29 00 to 30 00
Steel axles	28 00 to 29 00
Axle turnings	18 00 to 19 00
Wrought turnings (free from cast)	16 00 to 17 00
Cast borings	11 00 to 11 50
Uncut wrought iron boilers	12 00 to 13 00
Steel boiler plates	18 00 to 19 00
Grate bars	13 00 to 14 00
Pipes and flues (clean)	17 50 to 18 50
Tank iron	17 00 to 18 00
Hoop and band iron	13 50 to 14 50
Sheet iron	12 00 to 13 00
Wrought drillings	15 50 to 16 50
Malleable iron (railroad)	20 00 to 20 50
Malleable iron (agricultural)	17 50 to 18 00
Stove Plate	16 00 to 17 00
Heavy Steel	20 50 to 21 50

CINCINNATI.

April 7.

The general situation as to volume of business shows but little change. The announcement of the new schedule of prices by the associated Southern furnaces has resulted in disturbing conditions in the pig iron market. The coke market continues easy, with quick shipment 72-hour foundry coke obtainable at $6 f. o. b. ovens, while contracts for extended deliveries can be placed at $5.50 f. o. b. ovens. Deliveries of pig iron continue to come forward with moderate promptness. In finished material the demand continues fairly active and the market steady.

PIG IRON.—The new schedule of prices established by the association of Southern furnaces last week has caused an irregular and unsettled situation as to prices. Buyers are still holding off and the amount of business transacted during the week was quite moderate. It is by no means clear what action the independent furnaces will take in regard to the new schedule. The current market price for No. 2 foundry is $17.50, Birmingham, for any delivery. There have been transactions down to $17 Birmingham, but it is stated in some quarters that prices below $17.50 Birmingham are becoming more difficult to obtain. Sales aggregating 3,000 to 5,000 tons of No. 4 gray forge and mottled for early deliveries are reported at schedule prices, but it is not stated whether it is for Eastern or Western territory. There is apprehension that the $1 per ton differential between Eastern and Western territories will become a troublesome element in the situation. Conditions admit of so many phases and probabilities as to outcome that speculation in regard to the trend the market may be expected to follow are futile. Buyers who had been practically convinced a week ago that $18 Birmingham for No. 2 foundry was a safe basis, it is believed will now defer placing orders for their future requirements or buy to cover current needs for the balance of the year, and this disposition not to buy ahead is gaining in favor with consumers of pig iron. We quote for any delivery f. o. b. Cincinnati:

Southern Foundry No. 1	$21 25 to 21 50
Southern Foundry No. 2	20 75 to 21 25
Southern Foundry No. 3	20 25 to 20 75
Southern Foundry No. 4	19 75 to 20 25
Southern Foundry No. 1, soft	21 50 to 22 00
Southern Foundry No. 2, soft	20 75 to 21 25
Gray Forge	19 25 to 19 50
Northern Foundry No. 1	23 15 to 23 65
Northern Foundry No. 2	22 15 to 22 65
Southern car wheel iron	27 75 to 28 75

FINISHED MATERIAL.—While the buying of finished material is not running to large lot orders there continues to be a good and well distributed demand for conservative quantities. The market for sheets is a little irregular and quotations are not

well defined. Both the leading interest and independent mills are quoting prices only upon application on large orders. Some retailers are selling small lots out of store slightly lower than previous quotations. Retail prices for beams and channels are also a shade lower, but these concessions obtain business so readily that there is good reason to believe that the general market is well maintained. We quote black sheets No. 27 at 2.78c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 3.10c; No. 27, 3.20c; No. 16, 2.65c; No. 14, 2.55c; No. 12, 2.45c; No. 10, 2.35c. Tank plates are firm and sell out of store at 2.15c for ¼-inch and 2.25c for 3-16-inch. Beams and channels are quoted at 2.15c to 2.25c from stock, and angles at 2.15c to 2.25c for base sizes. In merchant pipe the demand is fairly good. It is understood that independents have put out a price list lower than the leading interest's figures on wrought iron pipe, but the leading interests maintain that they are able to obtain full quotations owing to their ability to make prompt delivery. We quote:

MERCHANT PIPE.

(Basing Discounts.)

	Steel Pipe. Black. Percent.	Steel Pipe. Galv. Percent	Guaranteed Wrought Iron Pipe. Black. Percent.	Guaranteed Wrought Iron Pipe. Galv. Percent.
⅛, ¼, ⅜-inch	66.7	56.7	63.7	53.7
½-inch	68.7	58.7	65.7	55.7
¾ to 6-inch, inclusive	73.7	63.7	70.7	60.7
7 to 12-inch, inclusive	67.7	57.7	64.7	54.7

BOILER TUBES.

	Steel Percent.	Iron Percent.
1 to 1¼-inch	41.2	35.2
1¾ to 2½-inch	54.2	34.2
2¾ to 5-inch	59.7	44.2
6 to 13-inch	54.2	34.2

OLD MATERIAL.—An advance in the quotation for railroad No. 1 wrought is the only change in prices. The general market is fairly active. We quote:

Old No. 1 railroad wrought, net tons	19 25 to 19 75
Cast machine and foundry, net tons	17 00 to 17 50
Old iron rails, gross tons	22 50 to 23 00
Old steel rails, gross tons	21 50 to 22 00
Old short lengths, gross tons	17 50 to 18 00
Old iron axles, net tons	27 00 to 27 50
Old chilled car wheels, gross tons	22 00 to 22 50
Stove plate, net tons	11 50 to 12 00
Wrought turnings, net tons	15 50 to 15 75
Cast borings, net tons	12 00 to 12 50

PHILADELPHIA.

April 7.

As usual, when lower prices are named, buyers of pig iron are hesitating since the published reduction of prices by the southern association. Lower prices are hoped for and it will not be surprising if the market drags for some time. If foreign iron continues at prices which have prevailed recently, it can hardly compete with Southern iron at the new prices. Quotations by local furnacemen are somewhat lower, but there has not been a readjustment along the entire line. We quote as follows: No. 1 X foundry, $23 to $24; No. 2 X foundry, $21 to $21.50; No. 2 plain, $20.50 to $21; gray forge, $19 to $20; Middlesboro No. 3, $20.50 to $21; Scotch, $22.50 to $23.50; basic, $19.75 to $20.50.

BILLETS.—Prices being high, sales are rather slow. It is difficult to obtain prompt deliveries. Prices are about $32.50 to $33 for American and $28 to $29 on dock for foreign.

FINISHED MATERIAL.—Last week's quotations are not changed, but conditions are unsettled and there are frequent intimations that concessions are being made. The tendency is toward lower figures. Deliveries are easier. Production has increased as the railroad and fuel conditions have improved. We quote plates as follows: Small lots, 2c to 2.10c; carload lots, ¼-inch and thicker, 1.85c to 1.90c; universals, 1.90c; flange, 2.10c to 2.20c; firebox, 2.25c to 2.30c; marine, 2.30c to 2.35c. Steel bars are quoted 1.80c to 1.90c on prompt shipments from local mills; Western steel, 1.75c to 1.80c; bar iron, 1.93½c to 1.98½c. Structural material in small sizes is sold at 1.73½c to 1.80c; large sizes, 1.90c to 2.10c.

OLD MATERIAL.—Prices are steady and unchanged. We quote: Old steel rails, $21.50 to $22; miscellaneous heavy steel scrap, $20.75 to $21.25; low phosphorus scrap, $26.50 to $27.50; old steel axles, $27 to $28; old iron axles, $30 to $31; old iron rails, $25 to $26; old car wheels, $24.50 to $25.50; choice scrap RR. No. 1 wrought, $23.50 to $24; country scrap, $20.50 to $21.50; machinery cast, $19.50 to $20.50; No. 2 light scrap (forge), $17.50 to $18; No. 2 light scrap (ordinary), $14.50 to $15.50; wrought turnings, $16.25 to $16.50; wrought turnings, choice heavy, $16.75 to $17.25; cast borings, $11.50 to $12; stove plate, $16 to $17.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1909, NO. 150 NASSAU ST., April 7.

PIG IRON.—Following the formal announcement of the reduced prices of the Southern furnaces for the second half of the year, the pig iron market here became unsettled. The statement comes from a well informed source that prices of Northern grades are now $1 lower than a few days ago; while another, entitled to as much credence, states that no change in values has taken place in them. One thing is certain, and that is that buyers during the past few days have had the upper hand. The long-expected buying movement has not come with the reduction by Southern furnaces. Sellers frankly admit that they have found the strongest kind of disinclination among their customers to contract for the last half. Buyers contend that foreign makers will more than meet the attempt of the Southern furnaces to eliminate them as factors in the Eastern markets. Importers are anxiously awaiting mail advices from their principals. While Middlesborough No. 3 and Scotch warrants ruled a few days ago at 52s 6d and 57s 6d, respectively, closing cables today from abroad quote them at 49s 10½d and 54s 9d, respectively. All foreign irons are lower by 75 cents per ton today than before the action of the Southern producers was cabled abroad. Agents of importers here are confident that the foreign furnaces will hold their own in the Eastern markets, despite what has happened, and look for the Southern furnaces to make a still further reduction. Actual sales this week have been small. We know of a prominent New York concern which purchased 1,500 tons of Northern No. 2 spot at $21, delivered at its works, and it can contract for more at the same price. This would indicate a decline of at least 75 cents per ton from figures prevailing last week. The impression is strong that buying of the "hand to mouth" variety will be more pronounced during the balance of the year than has ever prevailed, because of the expectations of lower prices entertained by consumers. We quote: No. 1 X Northern, $23 to $23.50; No. 2 X, $22 to $22.50; No. 2 plain, $21 to $21.50; Southern No. 1 foundry, $22 to $22.50; No. 2 foundry, $21 to $22; No. 3 foundry, $21 to $21.50; No. 4 foundry, $20.50 to $21.

BILLETS.—The market for extended shipment declined during the week. For delivery the latter part of June German Bessemer basic billets can be had for from $29 to $29.50, and open-hearth billets for from $30 to $30.50, in large lots, New York delivery, duty paid.

FINISHED IRON AND STEEL.—The American Bridge Co. closed contracts during the week for the new buildings of the National Tube Co. at McKeesport, Pa., and Lorain, O., aggregating 20,000 tons, and for the new plate mill of the Carnegie Steel Co., aggregating 3,500 tons. For buildings in New York, Philadelphia and Pittsburg, orders taken by the company amount to 3,500 tons. The company has two contracts all but closed that call for 90,000 tons. It has not yet been able to effect a settlement with its men, but its operations are meeting with less and less resistance almost daily. Sheets continue to be firm, with some excellent buying, considerable reliance being placed in the report that the leading interest will announce an advance shortly. Plates still occupy a strong position, but premiums for prompt delivery are said to be a little easier. Bars are without change. New York prices are as follows: Beams and channels, 15 inches and under, 1.75c to 1.90c; angles, 3 to 6 inches, 1.75c to 1.90c; zees 1.75c to 1.90c; bulb angles, 2.05c to 2.35c; deck beams, 2.05c to 2.25c; sheared steel plates, tank, 2.10c to 2.15c; flange, 2.25c to 2.30c; fire box, 2.30c to 2.50c; refined iron bars, 1.95c to 2.10c; soft steel bars, 1.95c to 2.10c; steel sheets, in carloads New York, No. 28 black, 3.05c to 3.10c; galvanized, 75 and 2½ off to 75 straight.

F. R. Phillips & Sons Co., of Philadelphia, announces the removal of its offices to 801-2 Pennsylvania Building, Chestnut and 15th Sts. The company has also opened offices in London, Mr. Phillips having sailed recently to give it his personal attention.

The Metal Market.

NEW YORK.

OFFICE OF *The Iron Trade Review.*
ROOM NO. 1909, 150 NASSAU ST. April 7.

PIG TIN.—During the week the pig tin market declined sharply both here and in London, in consequence of the unprecedentedly large amount of visible supplies, and an exceptionally poor demand from consumers, who seem to have their requirements for several weeks already contracted for. From the standpoint of new developments the market has been more barren than for months. Closing prices at the Metal Exchange today were as follows: Spot to June, 29¼c to 29¾c. London's closings follow: Spot and futures, £135 15s. Arrivals at Atlantic ports for the month to date aggregate 235 tons, with 5,299 tons afloat.

COPPER.—Under very heavy offerings of casting, amounting to over 3,000,000 tons, and at about ⅛ of a cent less than current quotations, the copper market during the week has been lower, with all grades affected. The artificial aspect of the recent rise is beginning to show itself very plainly, and bearish views as to the outlook are not attacked with the vim they were a few weeks ago. Prices are normal, with the demand from the country giving greater dissatisfaction than we have had occasion to report in weeks. London is weaker, in consequence of the adverse situation prevailing here. Closing prices at the Metal Exchange today were as follows: Lake and electrolytic, 14½c; casting, 14¼c, and standard, 13¼c, all nominal. London closed today as follows: Spot, £62 7s 6d; futures, £62 10s. Exports for the month to date amount to 3,614 tons.

LEAD.—Unchanged here, being 4.67½c for lots of 50 tons or more. St. Louis is slightly lower at 4.57½c. London a shade weaker at £12 12s. 6d.

SPELTER.—Market continues strong with 5.70c asked for spot, and 5.60c for futures. St. Louis and London are firm at 5.40c and £22 15s, respectively.

ANTIMONY.—In fairly good demand, with Cookson's ruling at 8¼c to 8½c; Hallett's at 7c, and other brands at 6¾c.

QUICKSILVER.—Firm at $47 per flask of 76½ pounds, in lots of 100 flasks. London is £8 12s 6d.

NICKEL.—An exceptionally good demand is noted at 40c to 47c for large lots down to a ton, and 50c to 60c for smaller quantities.

CHICAGO.

OFFICE OF *The Iron Trade Review,*
519 MONADNOCK BLOCK, April 7.

Pig lead and spelter have both advanced since our last report, and copper is also strong, though without change as to price. There is a good demand for metals of all kinds, buying being in small lots. We quote lake copper, carload lots, 15c; smaller quantities, 15¼c. Pig lead, 4.65c in 50-ton lots, and 4.75c in carload lots. Pig tin is 31½c. Spelter, 6c in carload lots, and 6¼c for lesser quantities. Sheet zinc, 6½c to 6¾c for lots over 600 pounds. Antimony, 10¾c to 11c for Cookson's, and 9¾c for Hallett's, in small quantities.

Obituary.

William Warren Card, second vice president of the Westinghouse Airbrake Co., president of the Pittsburg Screw & Bolt Co., and otherwise widely interested in Pittsburg industries, met death at Pittsburg, Pa., on Saturday, April 4, under the wheels of a trolley car. He was one of the group of Pittsburgers who seconded the efforts of George Westinghouse to secure the introduction of airbrakes on railroad trains, and it was while he was superintendent of one of the divisions of the old Panhandle road that the first brake was tried on a run from Pittsburg to Steubenville, O. This was on Oct. 3, 1869.

Mr. Card was born Sept. 6, 1831, at Nelson, Madison County, N. Y., the son of a civil engineer, who educated him to his profession. While a young man he became one of the projectors of the Cleveland, Lorain & Wheeling Railroad and later became a division superintendent for the Panhandle. While thus engaged he met Mr. Westinghouse, with whom he later linked his fortune. For many years he acted as sales agent for the air brake which he first gave a trial and he retired one year ago from active business as second vice president of the company. Despite his very active career he found much time for the preparation of valuable papers which appeared from time to time in the technical press of the railroad world and in 1883 he became a member of the American Society of Civil Engineers.

Philip H. Sternbergh, vice president and general manager of the Kansas City Bolt & Nut Co., Kansas City, Mo., died at his home in that city, Thursday, April 2, after a brief illness of pneumonia. Deceased was the son of J. H. Sternbergh, president of the American Iron & Steel Mfg. Co., Lebanon, Pa. The remains were taken to Reading, Pa.

Trade Publications.

The recent catalogue of the Niles-Bement-Pond Co., of New York, deals with horizontal boring, drilling and milling machines, or floor boring machines. The first section of the work illustrates a number of the later designs in this type of machine and the remainder of the catalogue contains several illustrations showing the machines at work upon boring and milling operations of an interesting character. The illustrations are particularly fine.

The 1903 catalogue of H. B. Underwood & Co., of Philadelphia, is fresh from the printer and is devoted to portable tools for railway repair shops. This department is under the direct supervision of D. W. Pedrick, formerly of the Pedrick & Ayer Co., and the work contains an excellent halftone portrait of him. The various attachments are made for boring cylinders, Corliss valve seats, facing cylinder head joints, taper boring, milling, locomotive and other flat valve seats, dome facing, crank pin turning, etc.

A circular describes the Morse monitor nozzle for fire protection. This is manufactured by Andrew J. Morse & Son, Congress St., Boston. The nozzle has a capability of rotating completely on the base and at the same time can be elevated or depressed to cover any desired spot within range of the pressure and then locked in position.

Oliver Evans is the subject of the short story prepared by Messrs. Wyman & Gordon, manufacturers of drop forgings, of Worcester, Mass., in the latest addition to their series of industrial pioneers. Evans had many discouraging experiences in his engineering career, and these, with some account of his achievements under stress of many difficulties, form a brief tale of much interest.

A number of views of buildings and oil rooms of a few users of Bowser cabinets have been collected in pamphlet form by S. F. Bowser & Co., of Fort Wayne, Ind. The Bowser cabinets are made in various sizes and to separately accommodate different combinations of oils, etc. The cabinets form a neat and apparently very effective method of storing such liquids.

A recent publication of the S. Obermayer Co., of Cincinnati, relates to its Peerless follow-board compound. The use of this compound does away with chiseling out the follow-board from wood. The compound consists of a powder and a liquid and the resultant product becomes as hard as the wood.

A four-page circular from the Rand Drill Co., of 128 Broadway, New York, treats of the "Imperial" pneumatic tools and briefly describes and illustrates compressors, hoists, drills, hammers and air appliances of this design.

J. B. d'Homergue, manager of the "Keystone Hair Insulator" Department, of the H. W. Johns-Manville Co., sailed on March 30 for England, to make an investigation of the trade for asbestos and sound-deadening materials. Upon his return about May 1 he will be permanently located in New York.

The Angola Engine & Foundry Co., Angola, Ind., has rebuilt the part of its plant which was recently destroyed by fire and is nearly ready to resume work. The plant has been much improved by the new building and new equipment.

THE HANGING ROCK IRON REGION.

IRONTON, O., April 6.—The coal operators and the miners of this district held a joint meeting last week and agreed upon a temporary scale at existing wages to be effective until April 10, pending a settlement of the wage question for the ensuing year. The operators of the Jackson-Wellston district secured a similar agreement on a basis of 90 cents for pick mining.

With the organization of a local at Little Etna last week, the blast furnace workers of Ironton and Lawrence County have six locals with a combined membership of probably 1,000 men scattered among all the furnaces of the district. The men seem entirely satisfied with the recent advance in wages and there is no apparent disposition to press a demand for an eight-hour day, which has been discussed at their delegate meetings.

The refusal of the management of the Ashland Steel Co. at Ashland, Ky., to discontinue furnishing steel for the sheet mill there, which has had a strike on for some time, has resulted in the men declining to work and the steel plant is temporarily closed down. This will necessitate, should the strike be extended, the closing down of the Belfont and Kelly wire and wire nail mills here and also the Norton works at Ashland, all being dependent on the steel company for billets and rods.

The Belfont Iron Works Co. directors, at a meeting held last Thursday, declared a dividend of 10 percent, making 20 percent in dividends since Jan. 1.

The furnaces now actively engaged in this district are Big Etna, Sarah, Belfont, Union Iron & Steel, Hamilton, Lawrence, A. C. & I. (Ashland, Ky.), Hecla, Centre, Vesuvius, Madison, Milton, Wellston and Norton. All are in shape for steady operation unless there is a repetition of the strike in the coal and coke fields of West Virginia.

The strike at the firebrick plants of the Harbison-Walker Co. and the Olive Hill Firebrick Co., at Olive Hill, Ky., has been settled and the men returned to work at a slight advance over former wages.

J. H. Lee, president of the Ironton Coal & Iron Co., was here from Philadelphia last week and arranged to give the right of way for the T. & O. R. railroad through the company's extensive coal lands in this county, expecting to develop the Waterloo and Sheridan veins of coal and rich clay and limestone deposits when the road is extended.

The Columbus Iron & Steel Co. has begun the development of its coal property at Marting, W. Va., and will soon put in 100 ovens to supply the Columbus blast furnaces.

Lake Superior Iron Mines.

The Great Northern interests in the name of L. W. Hill have secured the state lease to lands on the western Mesabi range, controlled by the Mesabi Chief Iron Co. The consideration of assignment of lease was $55,000. The Northern has shown up 10,000,000 tons of low grade ore on the Mesabi Chief.

The deal which has been pending between the Incas Iron Co., of Duluth, and the LaBelle Iron Works, of Steubenville, O., for the lease of the new mine in the north half of 4-58-15, Mesabi range, has been closed. The LaBelle Iron Co. pays a bonus of $50,000 and an increased royalty of 10 cents a ton. The property contains upward of 4,000,000 tons of merchantable ore. The lease was obtained by the Incas Iron Co. from J. M. Longyear, of Marquette, on a basis of 25 cents a ton, and the LaBelle Iron Co. pays 35 cents.

W. P. Snyder and associates are reported to have secured a lease of the Kinney property at Buhl, Minn.

The Monongahela Iron & Steel Mfg. Co. will probably open an office in London, Eng., in the near future for the purpose of developing the foreign trade on its high grade iron bars and patent chain. Robert A. Carter, president and manager of the company, accompanied by his son, Howard Carter, are in Europe looking over the field.

The rail plant of the Pennsylvania Steel Co., at Steelton, Pa., broke all its records recently. The mill in one 12-hour turn made 557 tons one day and on another 541 tons.

MACHINE SHOP APPRENTICESHIP.*

BY A MACHINE TOOL MANUFACTURER.

In presenting this paper on the apprenticeship question, I have borne in mind the fact that the conditions of today are entirely different from the conditions of ten years ago, and prior to that date. At that time there were possibly 100 different forms of apprenticeship agreements between employers and apprentices. These old agreements were far from being uniform, which has resulted in a great deal of confusion; and I will endeavor to set forth what appears to be a suitable document for the conditions of today. The employers of the United States should certainly know better what is necessary in education for the apprentice, in the different trades that make up the modern machine shop—such as drawing, pattern making, blacksmith work, machinists, specialists, handy men, etc.—and I will endeavor to set forth as nearly as possible what appear to me to be suitable conditions under which to take apprentices, and how to meet our necessities for specialists, handy men, etc.

The ideas advanced have been decided upon after careful consultation with superintendents and foremen, and with a view of enabling manufacturers to so arrange matters with newcomers into the business, that they will receive suitable education for the work we intend them for, and at the same time provide a sufficient amount of first-class material to be able to hold our own for the highest grade of skill required in machine making. It is the opinion of all with whom I have consulted, that the employer is much better qualified to arrange such matters, not only for the general benefit of the manufacturing business, but also for the best interests of the employes, and to so grade the various classes of skill required as to make it possible for the employers to conduct manufacturing institutions under the new conditions that exist, so as to enable them to hold their supremacy in this line of trade without being trammeled by conditions and rules gotten up by men who are either not well posted as to the necessities of our various businesses, or not in harmony with the idea of making the United States the greatest manufacturing country on the face of the globe. We are all aware that the entire machine making industry has undergone a most wonderful change, and particularly in the last five years, and the following ideas are presented with the intention to meet the present and future conditions as nearly as possible.

There is today less need of the same large percent of apprentices that are to be carried through all the departments of the business, and a greater need for specialists. There is also a necessity for educating the specialists and the handy men according to what their future shall be as an assistant in manufacturing, than ever before. It has been largely the practice heretofore to have more apprentices under verbal agreements, than under written ones, and the reason for this has been because we have been unable to hold our apprentices, a contract not binding them in law, and even if it did, because of their lack of responsibility, it often becomes null and void. I have, therefore, decided to advocate dividing apprentices into several different grades, as follows:

Grade No. 1. To be taught the branches of lathe work, vise work, planer work, gear cutting and milling.

Grade No. 2. Lathe work and vise work only.

Grade No. 3. Lathe work only; vise work only; planer work only.

Grades No. 4 and 5. The handy man and the specialist.

For grade No. 1 clear through no apprentice should be eligible before 17 years of age. He should serve four years, and his rate of pay for the first year should be 6 cents per hour; for the second year 8 cents per hour; for the third year 10 cents per hour, and the fourth year 12 cents per hour.

For grade No. 2 the age should be 17 years; lathe and

*Read at the Buffalo convention of the National Metal Trades Association.

vise only; term of apprenticeship 3½ years, 3 of it on lathe. Rate of pay for the first year, 7½ cents per hour; for the second year, 9½ cents per hour; for the third year, 11½ cents per hour, and for the last six months 13½ cents per hour.

For grade No. 3: 17 years; lathe only; vise only; planer only. I would make the term of apprenticeship for this grade three years, and pay for the first year 10 cents per hour; for the second year, 12 cents per hour; for the third year, 14 cents per hour.

For grades 4 and 5—Handy man and specialist—I would make the term of service two years and require that the age should be not less than 19 years. Rate of pay for the first year, 10 cents; for the second year, 12 cents per hour, on advancing laborers.

I am well aware that these prices are higher than we have heretofore been paying; but is it not a fact that many apprentices apply who are unable to pay board, because of the very low rate of pay offered, and will not a more liberal system of wages attract four or five times more young men to the business than heretofore?

The low rate of pay has also resulted in many boys who were bright and brilliant fellows, and who would have done well at the business, being obliged to leave it for some such work as store work, porterage or laboring, in order to get more money in cases where it was absolutely necessary that they provide for themselves. While I have advocated the first grade at a lower rate of pay, this will result in obtaining apprentices who have good homes, good fathers and mothers, have received a good education and are able to continue the business until the full term of apprenticeship has been served.

I would also advocate that for grade No. 1 a bonus be paid at the end of the term, additional to the wage, of $200; for grade No. 2, $150; for grade No. 3, $100, and for grades No. 4 and No. 5, $75.

In the drawing room no boy should be received under 17 years of age. His term of service should be 4 years. First year, blue-printing; rate of pay, 10 cents per hour. Second year, tracing; rate of pay, 12 cents per hour. Six months shop experience would be advisable at this point. Third year, detailing; rate of pay 14 cents per hour. Between the third and fourth year, designing; rate of pay, 16 cents per hour.

In pattern shop work I would advocate that boys be taken not less than 17 years of age; term of service four years. The first year, 10 cents per hour, and 2 cents additional for each of the three years following. These rates of pay will prove so attractive that our pattern shops and drawing rooms will be well filled and with good material, and at the age at which they can give us efficient service. When the term of service is over, they are 21 years of age and capable of doing a journeyman's work anywhere. I would advocate that there be no set limit of apprentices, but that they be engaged so as to meet the requirements of the establishment that needs their service. Take for instance the drawing room, and suppose that 12 people are employed—six of these journeymen, and six of them apprentices. It is very doubtful, indeed, if the entire six apprentices will carry through their whole term of service, because in this department, unless a young man has the creative faculty, he can never become a designer; and it would be better in his case that he be taken into the machine shop and a new apprentice put in his place. We are all aware that there are not over 2 percent of real "top notch" men in all trades; I mean by that two men out of every hundred who become really first-class. If you will look around you will see that we do not have more than two brilliant doctors in one hundred, or lawyers, or men in any of the professions, even business men; therefore we have no right to expect a much greater proportion than this from our drawing rooms, pattern rooms and machine shops.

I am aware that all our members will not agree with all the ideas herein set forth; but there is unquestionably a crying need for a more thorough education as all around machinists, and more uniformity in the education of the handy men and the specialists. I also believe there is a necessity for a maximum rate being established for the specialist and the handy man, paying some percent less than we pay for a full fledged machinist. I think that under the conditions of today, and the rapid specializing of our various machine making industries, the tool rooms of the future will be two or three times the size of the tool room of the past, and that each manufacturing establishment will find it necessary to establish what is known as a special department—a department in which all machines, attachments and new work, that do not belong to the regular routine, shall be carried through. This department in large factories will assume even greater proportions than the tool room, and in these two departments there is a splendid opportunity for the full education of the all-round machinist.

When exceptionally bright and brilliant men are found, either among the specialists or among the handy men, special provisions could be made in these cases to advance such men through the different departments so as to get the benefit of their ability. Heretofore there has been very little attempt at using the handy man in the pattern shop, but I believe in this department there is ample room for the handy man and the specialist. I believe we have not given sufficient attention to this department of our business, neither are we making use of many machines that are used in wood working shops, that could be well applied in the pattern making shop. I would advise our members to look into this quite seriously and to establish a department of handy men, such for instance as in the repairing of patterns. We well know that a carpenter could take a broken or bruised pattern, cut out the bruised place, glue in a new piece and shape it up to the proper shape, and there is no necessity for having a man of high grade skill to do this. We are also well aware that a first-class handler of wood working machines could take work that has been laid out by a good pattern maker and machine it to a point ready for glueing up, and in a great many cases could even glue up the work.

H. C. Frick Coke Co. Absorbs Coke Companies.

All the coke producing companies of the United States Steel Corporation operating in Pennsylvania were merged last week into the H. C. Frick Co., with a capital of $20,000,000. That this would be done was predicted in these columns last week. All of the companies absorbed have been managed by the H. C. Frick Coke Co. for nearly two years, but with further concentration better results can be achieved. The United States Coal & Coke Co., operating in West Virginia, was not included in this merger. The companies merged have approximately 18,000 ovens with an annual producing capacity of 10,500,000 tons per year. The output constitutes three-fourths of the output of the Connellsville field. The corporations merged are the H. C. Frick Coke Co., $10,000,000 capital; United Coal & Coke Co., $1,225,000 capital, formerly owned by National Tube Co. and American Steel Hoop Co; McClure Coke Co., $1,100,000 capital, formerly owned by the H. C. Frick Coke Co.; Continental Coke Co., $1,000,000 capital, formerly the property of the National Steel Co.; American Coke Co., $25,000 capital, formerly owned and operated by the American Steel & Wire Co.; Southwest Connellsville Coke Co., $5,000,000 capital, formerly owned and operated by the Illinois Steel Co. Thomas Lynch will remain president, D. H. Coble secretary, and Phillip Keller treasurer. The directors are Thomas Lynch, C. M. Schwab, E. H. Gary, E. J. Buffington, W. P. Palmer, W. B. Schiller, Thomas Morrison, D. M. Clemson, D. E. Kerr and D. H. Coble. The headquarters will remain in Pittsburg. As pointed out in these columns last week further mergers are under way. The absorption of the Shelby Steel Tube Co. by the National Tube Co. is anticipated in the near future, although the National company at present operates the Shelby company's plants.

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THE DIGESTION OF NEW SECURITIES.

In the first newspaper interview which J. P. Morgan has given out for over two years, or since the time of the formation of the United States Steel Corporation, he referred to many of the securities which have been issued as still "undigested," though he had no fears as to the assimilation of the bulk of them in view of their soundness. It is an interesting fact that the scarcity of loanable funds, which financial wiseacres have been heralding as a menace, is one of the most potent agents in the digestive process. When money is easy stocks are bought freely by the public on narrow margins, being actuated by the general appearance of prosperity, and too often by the encouragement of less conservative brokers, who have an eye to the difference in the rate of interest they charge their customers and the rate at which they can themselves borrow money. When money tightens and the stock market possibly declines, such stocks are either sold to people better capable of holding them, or if the owner has the money they are taken out and the actual certificate issued to the real owner, who thereupon views as an income investment what he had previously regarded as a speculation. The large and steady increase in the number of registered holders of United States Steel Corporation stocks is a clear evidence of this process. There has been undoubtedly a much smaller increase in the number of quasi-holders of the stocks. In this way and by the immediate outright purchase of securities has the digestive process been carried on.

How necessary this process is, and how over-optimism concerning its realization needs to be guarded against, appears from a consideration of the volume of securities in the country. The entire wealth of the United States is estimated at $94,000,000,000. Securities issued are approximately as follows:

Industrial consolidations, etc.	$9,231,136,698
Gas, water, light, street railway, telephone, telegraph, etc.	4,519,597,819
Steam railroads	11,688,147,091
	$25,438,881,608

Of course these figures do not necessarily represent actual wealth, being simply the par or face value of preferred and common stocks and bonds. On January 1, last, the total stocks and bonds admitted to the listed and unlisted departments of the New York Stock Exchange amounted to $18,157,493,423. Besides these are stocks and bonds dealt in on the "curb" in New York, and similar securities dealt in at various local exchanges, but not in New York. On the same date the actual money in circulation in the United States was $2,348,700,901, or, say, one-eighth the face value of securities traded in at the New York Stock Exchange. Clearly the process of digestion to which Mr. Morgan refers is an absolute necessity.

While new railroad securities issued replace other securities, or are issued against actual money spent, the "trust" issues represent the creation of securities against property formerly held in not easily negotiable form, and are, therefore, a further drain on the loaning power of banks and trust companies. But against this is an influence the importance of which is not sufficiently realized. Practically all the "trust" securities now in the market represent properties which were formerly operated as private concerns. These did business with their customers largely on credit, and were large borrowers from banking interests on mortgages and commercial paper. In the present conduct of the same business this borrowing is wiped out, and the extension of credit to customers is reduced to a small fraction of what it was formerly. In addition to doing a practically cash business and borrowing no money, the large corporations maintain heavy reserves, sinking funds, and cash working capital, their cash deposits in some cases being enormous. They thus contribute very largely toward alleviating the condition which the issue in negotiable form of their own securities created. On December 1, last, the United States Steel Corporation had $54,724,106 actual cash on hand, while its current assets were $222,367,839 against only $49,311,863 current liabilities; and even this sum included a large amount of purchase money obligations, a temporary incident of the corporation's formation, leaving net current assets of $173,055,976. In the conduct of an ordinary private enterprise these current assets, represented by cash, accounts and bills receivable, etc., would be balanced very largely by commercial paper outstanding.

TROUBLE IMPENDING IN STRUCTURAL LINES.

A general strike affecting all sections of the country except St. Louis and possibly a few other centers is expected to occur on May 1, as a result of the arbitrary demands made on manufacturers and erectors of structural steel and iron work, by the unions affiliated with the International Association of Bridge and Structural Iron Workers. Although the latter organization is still in its infancy, the pending demands are probably more arbitrary than have ever been presented to a body of manufacturers in this country, and the latter for their own protection are compelled to resist their enforcement to the utmost. The effect of such a strike will be to tie up temporarily all large building operations, and many artisans outside of the structural workers will be compelled to lay down their tools. It is estimated that no less than 20,000 structural workers will walk out, while estimates of the other workers that will be thrown idle are entirely out of question.

None of the scales presented to the manufacturers are binding so far as the unions are concerned, as the latter

have inserted a clause which provides that sympathetic strikes are no violation of the agreement. The mere discharge of a man might precipitate a strike, while building operations on large structures, where many different unions are represented, could be tied up indefinitely while some organization would be attempting to force the adjustment of alleged grievances. Another demand that will not be granted provides for the employment of union men only, and practically bars out laborers who heretofore have been employed in large numbers for unloading and handling material.

The present strike against the American Bridge Co. was precipitated through the enforcement of the union regulations that only structural workers be engaged to erect the false work on bridges and viaducts. But inasmuch as there is no such provision in the scale now in force, and it appears for the first time in the new scale, the claim of the officers of the structural workers' organization that the American Bridge Co. violated the scale must be made to rest on some other ground.

No uniform scale covering all sections of the country has been presented by the International Association, the unions in the different sections having prepared their own demands, and no two scales are exactly alike. Despite this fact President Buchanan of the International Association insists that all settlements be made this year through his office, instead of with the separate unions, as has heretofore been done. In view of the many scales presented, the manufacturers have concluded to treat with the unions whose members they employ, and they will not treat with the International organization. That the latter is powerful can not be denied, and temporarily a serious disturbance of construction may result; but the time has not yet come when employers with eyes open will sign an agreement which expressly binds but one party to it, leaving the other as free as before he signed.

REPORT OF THE U. S. STEEL CORPORATION.

The annual report to the stockholders of the United States Steel Corporation for the fiscal year ended December 31, 1902, was issued April 7.

The income account for the year shows total net earnings of all properties, after deducting expenditures for ordinary repairs and maintenance, also interest on bonds for the subsidiary companies, of $133,308,764; less sinking funds on bonds of subsidiary companies, $624,064; depreciation and extinguishment funds, $4,834,710; extraordinary replacement funds, $9,315,615; special funds for depreciation and improvements, $10,000,000; total, $24,774,389; balance of net earnings for the year, $108,534,374. Interest on United States Steel Corporation bonds for the year, $15,187,850; sinking funds on United States Steel Corporation for the year, $3,040,000; total, $18,227,850; balance, $90,306,524. Dividends, 7 percent, preferred stock, $35,720,177; common, 4 percent, $20,332,690; total $56,052,867, leaving undivided profits or surplus for the year, $34,253,557. Previous surplus, $43,620,940; total surplus, December 31, 1902, $77,874,597, which includes the capital surplus of $25,000,000 provided at date of organization.

The physical condition of the properties has been fully maintained during the year, the cost of which has been charged to current expenses, and the amount expended by all properties for maintenance, renewals and extraordinary replacements aggregated $29,157,014. Provisional charges were made monthly to operations for sinking fund and to establish funds for depreciation and for reserves for extraordinary replacements.

The total redeemed bonds by the company at par value by trustees on December 31, 1901, was $907,000; redeemed in 1902, $3,115,000; total, December 31, 1902, $4,022,000. The balances to the credit of the several funds on December 31, 1902, are included in the current assets of the organization, viz.: In general cash, $1,773,333; in current assets, cash, marketable securities, inventories, etc., $18,491,146; total, $20,264,479.

The volume of business done by all companies during the year, including sales between the companies and the gross receipts of transportation and miscellaneous properties, aggregated $56,613,479. The production of iron ore mines for the year was 16,063,179 tons; coke manufactured, 9,521,567 tons; coal mined, not including that used in making coke, 709,567 tons; blast furnace products, 7,975,530 tons; steel ingot production, 9,743,918 tons. Total tonnage of rolled and other finished products for sale, 8,197,232 tons. The aggregate inventory of all properties on December 31, 1902, equaled the total sum of $104,390,844. About one-third of this sum is represented by the value of iron ore on hand.

The quantities of partly finished materials and of finished products are somewhat above the normal average, owing largely to the railroad congestion at principal producing centers, which prevented prompt delivery from the mills. Inventories are taken on basis of actual cost of material and products at the several departments of the company holding the same. Total capital stock of the corporation issued and outstanding on December 31 was $508,302,500 common stock and $510,281,100 preferred stock. The bonded and mortgaged debt of the United States Steel Corporation and subsidiary companies in the hands of the public at the beginning of the year was $366,097,698; issues made during the year by several companies, $2,370,338; total, $368,468,036; total bonds and mortgages paid and cancelled during the year, $1,697,577; bonds purchased by trustees of sinking funds for investment, $3,115,000. Leaving the bonded, debenture and mortgaged debt December 31, 1902, $363,655,459, a net decrease during the year of $2,442,239. Purchase money obligations and bills payable paid off between April 1, 1901, and December 31, 1901, amounted to $11,047,971; paid off during 1902, $13,652,368, a total reduction of $24,700,339.

The funds for the payment of these liabilities were provided entirely from the surplus net earnings of the organization, no new capital or bonded or other liability having been created in lieu thereof. The amount of these liabilities outstanding on December 31, 1902, was $6,689,419; bills payable, $6,202,502; special deposits, $4,485,547, a total of $17,377,467. The expenditures made during the year by all the properties and charged to property account were $16,586,532.

The average number of employes in the service of all properties during the entire year was 168,127, receiving for salaries and wages $120,528,343. Total number of stockholders in March, 1903, was 58,629, an increase of 15,610. This does not include the subscription for preferred stock by the 27,379 employes who were granted the opportunity to participate in the profits of the organization through the purchase of the preferred stock of the corporation.

The tonnage of unfilled orders on the books at the close of 1902 equaled 5,347,253 tons of all kinds of manufactured products, against 4,497,749 tons at the corresponding period in 1901. In many of the classes of heavier products, like rails, plates and structural material, practically the entire capacity of the mills is sold up until nearly the end of 1903.

The Quarterly Report.

The net earnings of the United States Steel Corporation for the first quarter of the calendar year, March estimated, after deducting outlays for repairs, renewals, maintenance of plant, interest on bonds and fixed charges, were $24,656,136. The net earnings for the first quarter last year were $26,279,599, showing a decrease for the first quarter this year of $1,623,463, this being attributed to the freight congestion of this year. After deducting amount set aside for sinking funds, depreciation and reserve funds there was a balance of net earnings for the quarter of $21,551,189. There was a further deduction for interest on the corporation bonds and sinking funds for the same bonds leaving a balance of $16,991,189. After paying the usual dividends on the preferred and common stocks there was left undivided profits for the quarter of $2,978,245. Unfilled orders on the books for manufactured products on April 1 were 5,410,719 tons.

National Metal Trades Association.

The fifth convention of the National Metal Trades Association held at the Hotel Iroquois, Buffalo, on Wednesday and Thursday, April 1 and 2, showed a marked advance both in numbers and spirit over the convention of the preceding year in Cincinnati. In our last issue the reports of the officers were summarized, these being presented at the opening session. After the meeting of the administrative council on Tuesday, President Watkins was called away to New York. His place was filled by G. F. Steedman, of St. Louis, whose direction of the work of the convention was strong, expeditious and clear-cut. The full list of those in attendance, together with their business connections, is given below:

S. W. Watkins, Christensen Engineering Co., Milwaukee, Wis.
E. F. Du Brul, Miller, Du Brul & Peters Mfg. Co., Cincinnati.
A. H. Bullard, Bullard Machine Tool Co., Bridgeport, Conn.
N. B. Payne, The Payne Co., Elmira, N. Y.
Robert Wuest, Secretary National Metal Trades Ass'n, Cincinnati.
M. H. Barker, American Tool & Machine Co., Boston, Mass.
H. N. Covell, Lidgerwood Mfg. Co., Brooklyn, N. Y.
W. P. Eagan, F. W. Wolf Co., Chicago.
F. B. Polson, Polson Iron Works, Toronto, Ont.
Lewis Searing, Denver Engineer Co., Denver Col.
O. B. Kinnard, Kinnard-Haines Co., Minneapolis, Minn.
W. H. Pfahler, Abram Cox Stove Co., Philadelphia.
J. W. Gardner, Gardner Governor Co., Quincy, Ill.
G. F. Steedman, Curtis & Co., Mfg. Co., St. Louis.
D. J. Kilby, Kilby Mfg. Co., Cleveland.
D. Davenport, Norwalk Iron Works Co., South Norwalk, Conn.
M. O. Reeves, Reeves Pulley Co., Columbus, Ind.
F. W. Boye, Jr., Schumacher & Boye, Cincinnati.
C. M. Stamp, C. & G. Cooper Co., Mt. Vernon.
R. L. Kenan, Jr., Pierce-Crouch Engine Co., New Brighton, Pa.
Wm. Medart, Medart Patent Pulley Co., St. Louis.
Geo. T. Bliss, Erie City Engine Co., Erie, Pa.
J. V. Wright, National Cash Register Co., Dayton, Ohio.
E. T. Gilbert, Michigan Bolt and Nut Works- Detroit.
Alex. I. Lewis, Michigan Brass & Iron Works, Detroit.
F. A. Strong, Eaton, Cole & Burnham Co., Bridgeport, Conn.
A. H. Folger, Lockwood Mfg. Co., East Boston, Mass.
C. F. Mayer, Rahn-Mayer-Carpenter Co., Cincinnati.
H. Ritten, Lunkenheimer Co., Cincinnati.
N. Du Brul, Miller, Du Brul & Peters Mfg. Co., Cincinnati.
E. N. Hargrave, Cincinnati Tool Co., Cincinnati.
James C. Hobart, Triumph Electric & Ice Machine Co., Cincinnati.
H. M. Norris, Bickford Drill & Tool Co., Cincinnati.
J. O. Thorn, Metallic Roofing Co., Toronto, Ont.
Frank A. Sheffler, Marine Engine & Machine Co., Harrison, N. J.
Wm. Lodge, Lodge & Shipley Machine Tool Co., Cincinnati.
N. R. Wood, Lodge & Shipley Machine Tool Co., Cincinnati.
M. E. Kennedy, Kennedy Valve Mfg. Co., Coxsackie, N. Y.
James Eastwood, Benj. Eastwood Mfg. Co., Paterson, N. J.
Si. P. Egan, J. A. Fay & Egan Co., Cincinnati.
C. S. Yarnell, Moore Carving Machine Co., Minneapolis, Minn.
Arthur E. Jones, J. A. Fay & Egan Co., Cincinnati.
J. N. Derby, Manning, Maxwell & Moore, New York.
P. B. Kendig, Seneca Falls Mfg. Co., Seneca Falls, N. Y.
T. L. Greenwald, I. & E. Greenwald Co., Cincinnati.
L. D. Reilly, Rochester, N. Y.
J. D. Hibbard, John Davis Co., Chicago.
F. K. Copeland, Sullivan Machinery Co., Chicago.
Fred. F. Stockwell, Barbour-Stockwell Co., Cambridge, Mass.
John E. Lynch, Hodge Boiler Works, Boston.
Chas. E. Elmes, Chas. F. Elmes Engineering Works, Chicago.
H. H. Latham, Latham Machinery Co., Chicago.
W. A. Stevenson, Norwood Engineering Co., Florence, Mass.
E. W. Knott, Lloyd-Booth Co., Pittsburg.
H. M. Kelly, Lloyd-Booth Co., Youngstown, O.
Edwin E. Bartlett, Boston.
Henry F. Arnold, American Tool & Machine Co., Boston.
A. M. Powell, Woodward & Powell Planer Co., Worcester, Mass.
Paul Blatchford, Secretary, Chicago Metal Trades Ass'n, Chicago.
H. E. Goodman, Goodman Mfg. Co., Chicago.
Henry M. Leland, Leland & Falconer Mfg. Co., Detroit.
E. P. Robinson, Atlantic Works, Boston.
W. A. Jones, W. A. Jones Foundry & Machine Co., Chicago.
George Rudge, Jr., Enterprise Boiler Co., Youngstown, O.
W. D. Sayle, Cleveland Punch & Shear Co., Cleveland.
Walter M. Bacon, American Tool & Machine Co., Boston.
C. Bermingham, Canadian Locomotive Co., Kingston, Ont.
Albert C. Fisher, Secretary, Cincinnati Metal Trades Ass'n, Cincinnati.
W. L. Pierce, Lidgerwood Mfg. Co., New York.
Chas. E. Hildreth, P. Blaisdell & Co., Worcester, Mass.
P. G. March, Cincinnati Shaper Co., Cincinnati.
Chas. E. Thomas, Cleveland Punch & Shear Works Co., Cleveland.
R. J. White, The Frost & Wood Co., Smith's Falls, Ont.
Fred W. Schultz, *Iron Age*, New York.
O. P. Briggs, Minneapolis Steel & Machinery Co., Minneapolis, Minn.
Thos. M. Roche, Manufacturers' Association, Cleveland.
Theo. P. Byram, Byram & Co., Inc., Detroit.
H. C. Hoefinghoff, Bickford Drill & Tool Co., Cincinnati.
D. D. Russell, James Russell Boiler Works, Boston.
H. P. Ellis, Bucyrus Co., South Milwaukee, Wis.
S. L. G. Knox, Bucyrus Co., South Milwaukee, Wis.
G. W. Watts, Canadian General Electric Co. and Canada Foundry Co., Toronto, Ont.
Geo. A. Lutz, Niagara Machine & Tool Works, Buffalo.
R. I. Clegg, *The Iron Trade Review*, Cleveland.
H. S. Teal, U. S. Headlight Co., Buffalo.
James Gleason, Gleason Tool Co., Rochester.
W. B. Cowles, The "Long Arm" System Co., Cleveland.
A. Falkenau, Falkenau-Sinclair Machine Co., Philadelphia.
F. Macomb Cresson, Geo. V. Cresson Co., Philadelphia.
John O. Adsit, Hornellsville Foundry Co., Hornellsville, N. Y.
H. D. Robinson, National Metal Trades Ass'n, Cincinnati.
R. W. Young, Weir & Craig Mfg. Co., Chicago.
W. L. Gilson, Employers' Association, Elmira, N. Y.
W. P. Davis, Rochester, N. Y.
E. G. Patterson, Canadian Gen'l Electric Co., Peterboro, Ont.
C. F. Wheaton, Dodge Mfg. Co., Toronto, Ont.
Leroy A. Williamson, Bickford Drill & Tool Co., Cincinnati.
H. A. Francis, Francis Hook & Eye Fastener Co., Niagara Falls, N. Y.
F. C. Olin, Olin Gas Engine Co., Buffalo.
M. F. Bowen, Secretary Manufacturers' Club, Buffalo.
W. B. Morrison, McIntosh & Seymour Co., Auburn, N. Y.
Edward D. Hooker, Iroquois Iron Works, Buffalo.
Wm. R. Perrin, Wm. R. Perrin Co., Chicago.
W. H. Carpenter, Rahn-Mayer-Carpenter Co., Cincinnati.
Alonzo B. See, A. B. See Elevator Co., New York.
H. F. Devens, National Cash Register Co., Dayton, O.
John Jeffrey, Jeffrey Mfg. Co., Columbus, O.
John J. Whirl, Employers' Ass'n, Detroit.
J. P. Harrington, Erie, Pa.
N. L. Candell, Barcolo & Boll Mfg. Co., Buffalo.
S. A. Johnson, The Lockwood Mfg. Co., Boston.
A. I. Findley, *The Iron Trade Review*, Cleveland.

WEDNESDAY AFTERNOON AND EVENING.

The time of the convention on Wednesday afternoon was taken up with reports from the various districts. These dealt with the labor situation, the number of hours per week worked in the various shops, the wage rate, premium and piece work systems, the supply of labor and the pendency or absence of demands from the men for changes in wages or hours. Naturally the information thus imparted was of a character that does not permit extended publicity.

A smoker, at which the members of the convention were guests of the Manufacturers' Club of Buffalo, was given at the Ellicott Club in the Ellicott Square Building, Wednesday evening. A session followed, presided over by John D. Larkin, president of the Manufacturers' Club. Wm. H. Pfahler, of Philadelphia, spoke briefly on the benefits of employers' associations and on the necessity for united action in view of the changes in industrial conditions which had come so rapidly in recent years. He avowed himself the friend of union workmen and affirmed that the employer was a better friend, as a rule, of the men who worked for him than were many of the men who as leaders of labor movements gave orders to the workmen. Mr. Pfahler held up the united effort of union wage-earners as a pattern for employers and commented on the fact that union representatives oftentimes showed better tactics in the presentation of their case in a conference called to pass on a labor question than did the employers. The latter, from lack of co-operation, and often from estrangements due to the sharpness of competition, had varying views of the issue presented, and were often less correctly informed about shop conditions than their organized employes.

D. Davenport, of Bridgeport, Conn., spoke of the boycott as an organized attack upon constitutional liberty and impressed upon his audience by a number of instances that had come within his own observation, the blighting effect of this assault upon the rights of citizens. He was followed by Col. S. M. Welch, of the 65th Regiment, New York National Guard, who directed attention to the openly avowed opposition of labor unions to the citizen soldiery. Every man over 18 and under 45 years of age is subject to call for service in the militia in certain emergencies. The labor unions, in forbidding their members to join the National guard, put themselves squarely in opposition to this constitutional provision. Col. Welch told the assembled employers how they might uphold the constituted

authorities and aid in preserving order and suppressing violence by standing back of those of their employes who joined the National guard. Instead of discharging men who were absent in camp or in response to an emergency call, or making a deduction for all the time lost, employers might fulfill their duty to the state by encouraging their men to join the militia and by seeing that their places were held open for them awaiting their return from service. The speech-making concluded with remarks by Commissioner Du Brul on the employers' associations as the logical outcome of the present industrial regime.

THURSDAY MORNING.

The second day of the convention was a busy one. Emphasis was put, in the discussions and in many of the papers, on organization and education as the two great needs—education for both employers and employes, so that both might make the best adjustment to the developments in modern industry that are crowding upon wage earner and wage payer.

Minimum Wage Rate.

A paper by H. M. Leland, of the Leland & Falconer Mfg. Co., Detroit, discussed the minimum rate of wage. He said that excepting, perhaps, the complete unionizing of his craft, no other theme so absorbs the thought of the trades unionist as that of the minimum wage. At the outset the speaker disclaimed hostility to trades unions. He was not sure that the unscrupulous greed of some employers does not force labor to organize to protect itself. He desired to see wage earners prosper, because when workmen were well paid and well employed they made a great army of consumers who kept the wheels of industry in constant motion. "The thought of the originators of the minimum rate theory," said the speaker, "was doubtless to establish the least rate of wages that should be paid to any tradesman or journeyman employed at his regular trade, and perhaps if this minimum rate could be kept low enough to measure the wage value of the poorest and most incompetent workman, and its influence could be so restrained that it would not in any way affect the better and more competent men, then it would not, perhaps, be either objectionable or harmful to either the wage earner or the employer. Such, unhappily, is not the way the thing works out in actual practice. In many plants where the minimum rate is recognized and holds dominion, it is the only rate; hence the minimum rate holds the anomalous position of a minimum and a maximum rate at one and the same time. In practice it is more a uniform rate than a minimum rate."

The speaker argued that this situation was unsatisfactory both to the workman and the employer, particularly to the superior men found in every plant. The unscrupulous minimum rate forces employers, against their judgment and sense of fairness, to pay more than they are worth to inferior men, and likewise forces them to pay the superior men a lower wage than would be gladly given them. Further, the minimum wage tends to make the employe apply the minimum wage to all his conduct, causing him to drift into the position where he works for the least wage, the least work, the least results, and he finally does, instead of his best, his poorest work.

The speaker advocated preaching the gospel of the best or maximum effort in every shop and factory, in every lodge room and forum, in school, in public prints. He pointed out that the minimum wage worked one of the greatest cruelties of the labor unions. The inferior workman, if permitted to work at the wage he can fairly earn, might be steadily employed, whereas the employer is obliged often to dispense with such men because they cannot earn for him what the minimum compels him to pay them.

As a remedy for present conditions Mr. Leland urged education—a wider dissemination of information concerning the complex conditions under which intensive production is carried on today. The vast army of organized labor mistakenly seeks to make work for more men by restricting output, increasing the cost, and attempts to get better wages by forcing an unfair minimum; provides defense funds running into millions; maintains powerful lobbies at seats of legislation. It becomes of utmost importance that the great organizations which are to control our industrial system should devise means of preaching truth to the masses of men, giving them the facts about the proper relation of employer and employe, and the wrongs and inconsistencies of trades unions; not seeking to destroy them, but persuade them to more equitable methods.

The speaker advocated the establishment by the National Association of Manufacturers of a great publishing house to produce and scatter literature designed to inform the people and supply the crying need for enlightenment on economic and industrial problems, and the dangers sure to follow the enforcement of mistaken theories.

Apprenticeship.

The paper on "Machine Shop Apprenticeship," which is given in full elsewhere in this issue, was also read at Thursday morning's session. Following the paper a resolution was adopted instructing the administrative council to take up the question of apprenticeship and prepare an indenture and code, which shall be communicated to the members of the association.

Labor Bureaus.

A paper under the title "The Labor Bureau" was read by J. C. Hobart, of Cincinnati. The writer has made a special study of the question and the suggestions he advanced were of the highest value to the members of the convention, representing the successful experience of the machine tool manufacturers of Cincinnati. Mr. Hobart conceived of the employment bureau as forming a connecting link between employer and employe and tending always to harmonize the two. The objects of an employment department of a local association of machinery manufacturers were stated to be:

To secure and tabulate information concerning the character, ability and previous record of every employe and to furnish such information on request to any of the members.

To find employment for deserving men in the shops of members.

To prevent undesirable persons from securing employment in the shops of members and to prevent apprentices breaking contracts.

Of the operation of the system in Cincinnati and of its possibilities elsewhere, Mr. Hobart spoke in detail as follows:

"The report of the first committee on employment department appointed by the Cincinnati Metal Trades Association contained the following clause: 'We desire to state that it is our opinion that any action which could justly be construed as an infringement of the right of any workman to sell his labor for the highest price obtainable or as curtailing a workman's right to leave his employment and secure work elsewhere, would be a mistake and would only result in failure.' This report was written a year and a half ago, and I believe in no case has the department taken any such action. That it is today an absolute power for good in our organization cannot be disputed by any one who takes the trouble to carefully examine its work.

"One difficulty which was experienced at the start, was to induce our members to list their employes and notify the secretary of applications and discharges. For a long time scarcely half of our members did this, but as we secured names of workmen some of our members found that the secretary was writing to their men that he had work for them and was finding them other positions. This arose, you will note, from the fact that one member had reported a man as leaving, and another had failed to report his employment, the man's name therefore remaining in the unemployed list. Members were inclined to be indignant at first, but on having it pointed out that it was due to their own negligence, they corrected the difficulty by sending in their reports promptly, and we now have every member reporting.

"You will also note the inducement this offers other firms to join our organization. A man's name must be

either in the employed or unemployed list. He may be at work in the shop of some outsider, but so far as our records go he is unemployed when he leaves a member's shop. As the sifting process continues, the bureau will eventually have a list of all of the best men and they will naturally be in the shops of our members.

"I am anxious to emphasize the importance of this feature. I have alluded to the large number of employers found in the ranks of the non-combatants, and it is strange that the majority do not seem to realize that organization on the one side cannot be directed, opposed or controlled except by organization on the other. Our membership is a small proportion of the total number of manufacturers of this country, the majority being apparently willing to stand aside and permit us to work out our emancipation alone, when we have done so, however, it is fair to assume that they will not refuse any benefits in the way of betterment of conditions we succeed in securing. In the ordinary course of events it might require a long time for us to show the results demanded by these skeptics before they are willing to join. Besides this, when they find they are benefitting by our work without the necessity of joining hands with us, it is possible this time may be indefinitely extended. Although a minority yet, because we are a unit, we will necessarily legislate for all, and the outsider will reap a portion of the benefit of our work whether we or he will it or not. In addition to this, the lack of his support delays the date upon which we would be able to show the results he demands before joining us.

"Under the operation of an efficient employment department, the sufficient reason is immediately provided. If he does not join he loses actual benefits in the way of securing competent men, and he will soon find that the good men are drifting into shops run in connection with the department. This process will increase in a very rapid ratio. The undesirable men drifting out are replaced by desirable men and the good men left in outside shops will not long work with a 'bum' element and will be increasingly anxious to get into an association shop. You can readily see that here are the conditions for a rapid healthy growth; it is to the interest of all members to report to the department and for non-members to become members. It is to the interest of good workmen to get their names listed and to keep their 'characters' clear, and they appreciate it.

"Some objection was made at the start by our own members that we would antagonize the men; that they would feel that it was an effort to prevent their bettering their condition, in spite of our avowed purpose to avoid anything tending to give that impression. The result has proved them incorrect. Much of the time of our secretary is occupied in talking to the men who call, and who, for various reasons, express themselves much more freely to him than they do to their own employer. This fact has resulted in bringing the attention of some of our members to abuses in their own shops, of which they were ignorant and which were immediately corrected. In two recent cases members have been apprised by the bureau of the actions of certain foremen that are apt to cause trouble.

"This suggests the possibility of making the department a means of discovering the causes of complaint and dissatisfaction by making it a clearing house for suggestions regarding the betterment of conditions on the part of the men themselves. The object is to show the men that they will not have to join a union in order to secure a hearing and redress for any wrong. We have not as yet taken any steps in this direction, but the possibilities of this branch of the subject are promising and deserving of careful consideration.

"We have repeatedly been able to induce apprentices to return and finish their terms, although, unfortunately, owing to the fact that apprenticeship contracts are not uniform or even general, we are somewhat handicapped. We have the apprentice question under consideration now and will undoubtedly be able to stop the present practice of apprentices leaving before their terms has expired. The machinery to accomplish all that is very simple, the indispensable requirement being a good man who will devote his whole time to it. We have three cards and four files in our office and a application and discharge blank in the hands of our members. These blanks are made out immediately on hiring or discharging a man, and mailed at once to the secretary.

"Application blanks are made out whether applicant is employed or not, and if not employed, he is given the secretary's card, which bears request to call on him. As these blanks are received by the secretary, they are properly entered on his cards and filed. A detailed description of the files is unnecessary here. We now have the names of 6,000 workmen on our cards. These are kept in a permanent file and bear any particular information regarding each man that we desire to keep. When unemployed the name also appears in the file indexed alphabetically as to specialty, such as lathe-planer, etc., enabling our secretary to answer immediately any demand for certain classes.

"Time will not permit of a further description of the operation of the department, but anyone interested can get full information by writing our secretary, Mr. A. C. Fisher, 148 E. Fourth St., Cincinnati.

"What I have said so far applies almost exclusively to a local department, and as the influence exerted must be primarily local, that is the first and most important development. Each local must be capable of controlling a local situation. No national organization can possibly do it unassisted. A National Information Bureau should be a clearing house for the locals—it should know which district was short of men and which had a surplus, and should devise some means of equalizing the conditions by transferring men from one to the other. This should stop the present practice of one locality advertising in another which was already short of men. It should keep a list of all men who were given national cards and these should only be given men who were known to be faithful. It could gather a force of men which it could use as strike breakers, employ them by the year and charge each local or individual member with their services when needed. Such a course would either enable us to stop the present guerilla tactics of the union, or at least to win in every case if such tactics were continued.

"Imagine for a moment the result of throwing fifty good men into any isolated shop struck by the union; it would practically decide the strike instantly, and, moreover, as soon as it were known that we had the ability to do this, strikes would not occur.

"The machinery of a National bureau would be very simple and its influence very great. Various employers' associations being organized under different constitutions, having in many cases a variety of objects, the task of federating them into one large body similar to the American Federation of Labor, which deals solely with labor, is an almost impossible one. If, however, each employers' association established its own labor bureau, these bureaus could all join a National bureau, the sole object of which was to deal with the labor question. This would be the line of least resistance in forming the American Federation of Employers.

"It has been decided by the convention of the National Metal Trades Association to start local departments in all principal centers. It cannot do this without the support of the employers in that locality; but if what I have said has not convinced you of the benefits to be secured and the good to be accomplished, both for the employer and their employes, then I have signally failed in my purpose and I hope you will attribute it to my logic and not to any defect in the plan itself."

Following the reading of Mr. Hobart's paper, a resolution was adopted recommending the establishment of local employment bureaus, conducted by local metal trades associations, and providing for rebating the amount of dues paid by members of the N. M. T. A. into such local associations up to 25 percent of the dues of the National Metal Trades Association. The resolution also made an appropriation for an organizer to carry on the work of establishing local associations.

Further action taken at the Thursday morning's session was the passing of resolutions of thanks to N. B. Payne, the treasurer of the association, for the able manner in which he had performed his duties.

A resolution commending Commissioner Du Brul was passed as below, the chairman adding to it his own personal tribute to the commissioner for consenting as a member of

(Continued on page 42a.)

THE STRUCTURAL WORKERS' DEMANDS.

That a strike of the International Association of Bridge and Structural Iron Workers will be declared on May 1, affecting all sections of the country except St. Louis and vicinity where the scale year expires on June 1, now seems almost certain. The stand taken by President Buchanan, that all wage agreements for the different districts of the country be made directly with the international association instead of with the unions directly affected, will be combated by the members of the recently organized National Association of Manufacturers and Erectors of Structural Steel and Iron Work. This organization has appointed executive committees in the various districts for dealing with the unions in their respective localities, and there will be no departure from this rule.

Furthermore the demands of the structural workers are considered so arbitrary that unless greatly amended they will not be acceded to by any of the concerns affiliated with the National Association of Manufacturers and Erectors. The advances in wages asked for in all sections are trifling in comparison with the other demands pretty generally made by all the unions. But for these demands there would be little difficulty in adjusting matters, as most of the manufacturers would pay the increased wages rather than have their work tied up.

In discussing the various scales presented, a manufacturer made the following statement to a representative of *The Iron Trade Review:* "Conditions have reached a climax and for the manufacturers to grant the demands of the structural workers would be suicidal. The point at issue and the one to be decided regards the control of our operations. Should we grant all their demands we would practically have no control of operations, and they could declare strikes when they saw fit under the provision of their scale which states that sympathetic strikes shall not be considered a violation of the scale. The demands they make regarding the employment of apprentices and only union men are outrageous, as we could not employ a laborer on any job according to the strict interpretation of the scale."

With but few exceptions the scales provide that one apprentice be employed for every seven journeymen and that only members of the union be permitted to work on any job. According to the various scales under which the structural workers are now employed, laborers are permitted to do the erecting of all false work, unloading of material, and all other work not requiring the skill of a structural worker. The employment of structural workers to do this kind of labor would mean the payment of from $3.40 to $4.80 per day for work that is now satisfactorily accomplished for less than half these wages. With few exceptions the scales provide that the declaration of sympathetic strikes shall not be considered violations of the agreement. The manufacturers will not consent to the insertion of this clause, as it leaves them no protection whatever, since sympathetic strikes could be declared on the slightest provocation.

The scale covering the employment of structural workers in New York calls for the payment of 56¼ cents an hour for an eight-hour day, the latter being the uniform day throughout the country. Furthermore, only union men will be permitted on any job, and the scale provides that the declaration of sympathetic strikes will not be taken as a violation of the agreement.

In New Haven and vicinity the demands are for 50 cents an hour, the employment of only one apprentice for every seven journeymen, and that all men employed on any job must be members of the structural workers' organization. Some leeway is given in the employment of laborers, as the material may be unloaded by them, but the handling thereafter must be by union men entirely. The sympathetic strike clause is also a part of this agreement. The Baltimore scale is practically the same as that of New Haven, with the exception of the ratio of apprentices, only one being permitted to every eight journeymen. Sympathetic strike clauses are also contained in these scales. In Pittsburg and within a radius of 135 miles the scale calls for 50 cents an hour and the employment of one apprentice to every seven journeymen. All of the work is to be done by union men, however, thus permitting no laborers on any job. The sympathetic strike clause is also a part of this scale. A separate scale has been formulated covering the Wheeling district and only differs from the Pittsburg scale in that it provides for the payment of the men twice a month, whereas the new Pittsburg scale calls for weekly pay days.

The Chicago scale calls for the payment of 60 cents an hour and embodies the same features practically as the Pittsburg district scale. The Milwaukee district scale is for 45 cents an hour, and during the months of June, July and August, when outside structural work can be carried on to the best advantage, the men are to have a half holiday on Saturday. Some leeway is given in this scale regarding the employment of laborers, but where it is necessary to use a tackle or derrick in unloading material only union men are to be employed. One foreman to a job is permitted who is not a member of the union.

The present scale covering the St. Louis district does not expire until June 1. The new demands made by the men call for the payment of 55 cents an hour and the payment of foremen of not less than 60 cents an hour, and furthermore they must be members of the union. The employment of helpers is only permitted on large structural work, when one to every seven journeymen is to be allowed. The scale covering the state of Colorado calls for 50 cents an hour and the union in addition to insisting on inserting the sympathetic strike clause states that it will not pledge itself to work while differences are being arbitrated.

The Pittsburg district scale, which embodies nearly all of the features contained in the scales for the other sections of the country, and is a fair example of the demands of the structural workers, is printed below:

ARTICLE I., Section 1: That the party of the first part agrees that on and after May 1, 1903, eight hours shall constitute a day's work. That time and one-half time be allowed for overtime. Double time for Sundays and the following holidays or days observed as such: Jan. 1, Feb. 22, Decoration Day, Fourth of July, Thanksgiving Day and December 25. No work shall be performed on Labor Day. Work shall commence at 8 a. m., and end not later than 5 p. m. The noon hour may be curtailed by agreement between the foreman and a majority of the workmen. Any work performed before or after the time herein specified shall be overtime.

SECTION 2: The party of the first part further agrees to pay a minimum scale of $4.00 for eight hours, or fifty cents per hour, and further agrees to have pay-day once a week. In case of a lay-off, the men shall be paid within twenty-four hours on the work unless otherwise agreed to by the men.

SECTION 3: The party of the first part agrees to employ in the erection of bridges, buildings, viaducts and all ornamental iron and steel structural work and all wood work pertaining thereto, including pile driving, the framing of false-work, derricks and travelers in Pittsburg and vicinity, only bridge and structural iron workers who are members of this union in good standing, or others who will become members of the union. The party of the first part further agrees that the business agent of the union shall have access to the work at all times during working hours, but he shall not be allowed to interfere with or delay the men on the work during said work; also to allow a steward on each job who shall attend to the business of the union, without expense or inconvenience to the employer.

SECTION 4: On and after May 1, 1903, until May 1, 1904, the party of the second part hereby agrees to allow one apprentice to every seven bridge and structural iron workers on each job.

For the first six months of apprenticeship, said apprentice will work in the distributing or assembling gang. For the second six months said apprentice shall work in the raising or distributing gangs. For the third six months said apprentice shall work in the riveting, raising or distrbuting gangs, as case may require.

For the first six months of apprenticeship, said apprentice shall receive not less than 50 percent; for the second six months said apprentice shall receive not less than 70 percent; for the third six months said apprentice shall receive not less than 90 percent of the prevailing wages of journeymen. Articles I. and II., Section 1, 2 and 3, apply to all apprentices.

ARTICLE II., Section 1: The party of the second part agrees that it will not permit its members to perform any work for any contractors that fail to comply with this agreement, but will use all lawful methods and call on the trades council and all affiliated trades unions to assist us to further our ends.

SECTION 2: The party of the second part further agrees that in case of trouble or any misunderstanding between the parties to this agreement, that the difference shall be arbitrated and work shall proceed pending the arbitration under the conditions of this agreement, but none of the definite articles of this agreement shall be subject to arbitration. The arbitrators shall be three disinterested parties—one selected by each party to this agreement and the third to be selected by these two, and the decision of these arbitrators shall be binding on both parties. The decision of these arbitrators shall be rendered within six working days.

SECTION 3: Sympathetic strikes shall not be considered a violation of this agreement.

SECTION 4: This union strictly forbids piece-work of any kind, and will not tolerate it under any consideration.

SECTION 5: In case it is desired by the party of the first part, more than one shift may be employed on the same work, paying each shift only the regular scale of wages provided for above. The hours of work of the day shift may be changed by consent of the employer and his men. The hours of employment of any shift shall not be more or less than eight hours. No member of this union will be allowed to work more than one shift unless he be paid the overtime rate for all over eight hours.

Foremen in responsible charge of the work need not necessarily be members of the union, and but one such foreman shall be permitted on the job.

The jurisdiction of this agreement shall include all work in Pittsburg and within a radius of 135 miles of the corporate limits of Pittsburg, Pa.

No change shall be made in this agreement by either party without four months' notice, previous to such changes going into effect.

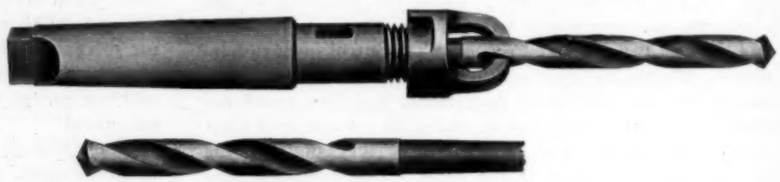
The managers of the Krupp estate have decided to carry out the plans of the late Herr Krupp and establish a large foundry and a rolling mill for the manufacture of steel rails at Duisburg am Rhein. Herr Krupp followed the development of the steel industry in the United States with great interest, and realized that unless German plants were established by the same methods as in America, they would be driven out of business.

The annual convention of the Amalgamated Association of Iron, Steel and Tin Workers will open on Monday, April 13, at Columbus, O. The wage committee will meet on Friday, April 10, for the purpose of formulating a scale to be presented to the convention. The officers of the association are not in favor of any advances and the indications are that with a few minor changes in the foot notes, the scale will be the same as the one under which the members of the association are now working.

A NEW DRILL SOCKET.

The lower part of the illustration shows a not uncommon experience with twist drills. The tang has had to bear the brunt of the struggle with the work as the taper fit evidently failed to hold its own and the result has been disastrous. The drill so injured may be turned down and there enter the socket to the former depth, another tang nulled on the shank and a fresh start made. As a general rule this procedure is too much trouble and the drill starts on the trip to the scrap heap. The upper portion of the illustration presents a recently patented method of getting around the difficulty mentioned above. The socket is designed with a driver in order to improve the tang or tail driving condition of the devices. The invention in the first place was intended to make use of the large number of drills which as shown by the illustration must depend upon some other than the tang for drawing purposes. The new socket not only takes these tangless drills but as readily accommodates new ones. The driving, as may be easily understood from the illustration, is done by the fingers combined with the taper fit of the drill in the socket.

The socket has an external thread on which a nut with two opposing fingers is fitted. The finger tips rest within the grooves of the twist drill. In order to insert the drill in position the nut or driver is removed and passed over the point of the drill, the finger ends sliding readily in the grooves. The nut is then replaced on the socket and turned back to grip the ends of the grooves in drill,



A NEW DRILL SOCKET.

holding the tapered parts firmly in place. Should the workman fail to get the nut back to the proper place on the thread, the action of the drill will turn it into the driving position.

These drill sockets are made in four sizes: No. 1 takes drills from ¼-inch to 19-32-inch diameter; No. 2 from 39-64-inch to 29-32-inch diameter; No. 3 from 59-64-inch to 1¼ inches; and No. 4 from 1 17-64 inches to 2 inches. These are made to fit the standard Morse taper. The sockets are manufactured by Charles C. Roberts, of Ansonia, Conn.

J. J. Turner, third vice president of the Pennsylvania lines west of Pittsburg, has awarded to the American Car & Foundry Co. a contract for 3,000 steel and wooden cars to cost approximately $3,000,000. Early deliveries are exacted. The Pressed Steel Car Co. has heretofore been the exclusive recipient of orders from the Pennsylvania for steel cars, but it is said that in the future the orders will be distributed. The Standard Steel Car Co. was invited to participate in the bidding but was unable to enter a bid because its shops at Butler are practically filled with contracts. The order consists of box cars, hoppers and gondolas. They will be made at the Detroit plant of the company.

Work is advancing rapidly on the two furnaces of the Buffalo & Susquehanna Iron Co., adjoining the site of the Lackawanna Steel Co.'s plant at South Buffalo. Four stoves are up and the second four are well advanced. It is expected that one furnace will be put in blast in October. The company will cut a canal from Lake Erie to its furnace site and ore will be unloaded direct into the furnace yard. Pennsylvania Railroad interests will also construct a canal through adjoining property, and will construct docks, making South Buffalo an important freight-receiving point.

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the association to take up the arduous duties of the commissionership, not being attracted as one from the outside by the emoluments of the position, but accepting it as a call to duty.

Resolved, That this association in convention assembled extend to Mr. E. F. Du Brul our thanks for his sacrifice of personal business interests in assuming the commissionership of this association, and that we wish to express our gratification with the manner in which he has served in this very important office, and that we pledge our fellow member commissioner our support in his faithful work.

The financial report of the association at Thursday's session showed a large cash fund on hand, and in view of the value of such an asset it was voted unanimously to increase it by an assessment gauged by the number of employes in each shop.

Announcement was made of a special Cincinnati train to the National Association of Manufacturers' convention at New Orleans, April 14-16, the train leaving Cincinnati Sunday night, April 12, and after the convention going to Mobile, Pensacola and other points, reaching Cincinnati on Sunday, April 19.

In this connection the following resolutions were adopted:

Resolved, That the National Metal Trades Association approves and heartily commends the successful work of the National Association of Manufacturers in opposing the nefarious legislation which has been pending before the National Congress.

Resolved, That this association appoint three delegates to attend the annual convention of the National Association of Manufacturers, to be held in New Orleans, April 14 to 16, 1903, whose duty it shall be to present the views of this organization and to present or further such resolutions as shall be in line with the policy of this association.

Resolutions were adopted also asserting the rights of independent workmen and opposing the boycott as applied to free workmen and manufacturers. The first of these is as follows:

Resolved, That the National Metal Trades Association in convention assembled heartily approves the formation of organizations of independent workmen for the securing and maintaining of their rights under the Constitution of the United States, and pledges its moral support to such efforts.

Two sets of resolutions referring to the boycott were presented and both were adopted. The first is as follows:

WHEREAS, The boycott is cowardly and un-American, and has been stigmatized as immoral, cruel and anti-social by the Anthracite Coal Strike Commission; be it

Resolved, That each member of this association in making purchases give boycotted firms the preference over all competitors until such boycott is declared off, and

Resolved, That our administrative council be instructed to enter into reciprocal agreements with as many other associations as will adopt similar resolutions and incorporate them in their proceedings.

The second set refers to setting on foot active propaganda against the boycott. It is as follows:

WHEREAS, The boycott as a weapon to coerce employers to discharge non-union men, to surrender the management of their own business and to restrict their output, has now become a very serious menace to the interests and fundamental rights of individual employers and employes, as well as to the industrial prosperity of the country, and as the boycott is a distinct violation of the law of the land and the instances in which it is employed are innumerable and the individuals so attacked are unable to combat it single handed; and

WHEREAS, A combined effort on the part of all good citizens is sorely needed to educate the people of the United States to a realization of the extent to which the practice is carried, as well as of its illegality and disastrous effects on their welfare, and of its undermining of their constitutional rights; therefore be it

Resolved, That it is the sense of this association that a national organization should be formed to resist the boycott by proper and legal means, to assist in the enforcement of the laws against the same and to create a strong public sentiment against it; and that we further recommend to our individual members to co-operate in every way in such a movement.

Several resolutions were adopted emphasizing the necessity of educational work in an organized and well-directed way. Two of these are given below:

Resolved, That the administrative council of this association is requested to establish in co-operation with other like associations an educational bureau under the management of broadminded men, which shall by publications, lectures and other advanced methods disseminate correct information in order that the heresies of trade unionism may be controverted and a lasting harmony between labor and capital be established.

Resolved, That the president and commissioner are hereby instructed to invite the executive officers of such associations as may have for their object fair and equitable dealings between employer and employe, and the preservation of their respective freedom of employment, to form a permanent organization which will tend to bring about the personal acquaintance of said officers and form a clearing house for ideas which may assist in the fulfillment of our organic principles.

The third resolution on educational work declares the need of general education by systematic methods on all phases of the industrial situation; endorses the sentiments expressed in the paper of H. M. Leland on minimum wage rate; and protests against the aim of organized labor to make more work by restricting output.

THURSDAY AFTERNOON.

The principal papers of the afternoon session of Thursday were by Geo. T. Bliss, of the Erie City Engine Co., Erie, Pa., on "Hours of Labor;" M. O. Reeves, of the Reeves Pulley Co., Columbus, Ind., on "Educational Work Among Employers and Employes;" W. B. Cowles, of the Long Arm System Co., Cleveland, on "Legislation;" Charles E. Hildreth, of P. Blaisdell & Co., Worcester, Mass., on "How to Build up the Membership of Employers' Associations."

New Officers.

It is the custom of the association to appoint at each convention a nominating committee to recommend a list of officers to be elected at the convention of the following year. This committee was chosen Thursday afternoon and consists of H. N. Covell, of Brooklyn, N. Y.; O. P. Briggs, of Minneapolis, Minn., and G. F. Steedman, of St. Louis.

The report of the committee of 1903 on officers for the coming year was presented and adopted with enthusiasm. The list is as follows. The commissioner and secretary were chosen by the new administrative council at a meeting held Thursday afternoon:

President—S. W. Watkins, Christensen Engineering Co., Milwaukee, Wis.

First Vice President—H. N. Covell, Lidgerwood Mfg. Co., Brooklyn, N. Y.

Second Vice President—J. W. Gardner, Gardner Governor Co., Quincy, Ill.

Treasurer—F. A. Geier, Cincinnati Milling Machine Co., Cincinnati, O.

Councillors for One Year:

G. F. Steedman, Curtis & Co. Mfg. Co., St. Louis, Mo.

N. B. Payne, Payne Co., Elmira, N. Y.

W. P. Eagan, Fred W. Wolf Co., Chicago, Ill.

M. H. Barker, American Tool & Machine Co., Boston, Mass.

For Two Years:

F. B. Polson, Polson Iron Works, Toronto, Ont.

O. P. Briggs, Minneapolis Steel & Machinery Co., Minneapolis, Minn.

Carl Horix, Geo. B. Sennett Co., Youngstown, O.

A. Falkenau, Falkenau-Sinclair Machine Co., Philadelphia, Pa.

Honorary:

W. H. Pfahler, Abram Cox Stove Co., Philadelphia, Pa.

Commissioner—E. F. Du Brul.

Secretary—Robert Wuest.

The selection of the next meeting place is in the hands of the administrative council.

The Weaver Coal & Coke Co., Chicago, advises us that in addition to the coke plants now situated at Weaver, W. Va., it is its intention to add considerably to that plant within the near future, and in addition to the three mines now being operated at Weaver, W. Va., it expects to have three more open within the next six months. This company has acquired within the past year and is now operating ten Western coal mines situated on the Illinois Central Ry., C. & E. I. Ry. and C. & A. Ry.

The Buffalo Forge Co., Buffalo, N. Y., announces the establishment of a branch office in Detroit at 1409 Majestic Building, in charge of H. M. Brightman.

THE FOUNDRYMEN'S ASSOCIATION.

The regular monthly meeting of the Foundrymen's Association was held at the Manufacturers' Club in Philadelphia, on Wednesday, April 1, the president, Thomas Devlin, occupying the chair. The following were present:

Thos. Devlin, Thos. Devlin Mfg. Co.
J. Thompson, J. Thompson & Co.
E. E. Brown, C. R. Brown, A. D. Wallace, and W. J. Faux, E. E. Brown & Son.
Thos. Furlow and Jas. Furlow, Furlow Sanitary Brass Mfg. Co.
W. Robertson, Charlier Oil Melting Furnace Co.
A. A. Miller, *Iron Age.*
Paul Van Fleet, Van Fleet & Freas.
E. Cooper Wills, Uniform Steel Co., Rahway, N. J.
Thos. J. Kelley, Thomas, Roberts, Stevenson Co.
J. S. Hibbs, J. W. Paxson Co.
A. E. Outerbridge, Jr., Wm. Sellers & Co.
W. P. Cunningham, A. & P. Roberts Co.
Thos. Pole, Creswell & Waters Co.
T. B. Harkins, Harkins Fdy. & Mach. Co., Bristol, Pa.
Dr. Edward Kirk.
H. O. Evans, Thos. Devlin Mfg. Co.
W. H. Ridgway, C. Ridgway & Son Co., Coatesville, Pa.
F. B. Gibbons, J. Wesley Pullman.
August Williams, Enterprise Mfg. Co.
J. H. Pepper, *The Iron Trade Review.*
H. L. Haldeman, Pulaski Iron Co.
Geo. C. Davis, chemist.
H. C. Matlack, Frank Samuel.
Andrew McClay and W. F. Bernstein, Jr., Bernstein Mfg. Co.
Jno. R. Lawrence, Jerome Kelley & Co.
F. Cooper Pullman, J. Wesley Pullman.
H. C. Mills, Schaum & Uhlinger.
A. G. Warren and Howard Evans, J. W. Paxson Co.

After the disposal of routine business the secretary, Howard Evans, announced the death of Thos. I. Rankin, an ex-president of the association, and a committee was appointed to prepare a suitable memorial to be entered upon the association record, and to be presented to the family of the deceased.

Schwartz Melting and Refining Furnace.

The paper of the evening was by E. H. Schwartz, of the Hawley Down Draft Furnace Co., Chicago, on the "Schwartz Melting and Refining Furnace for Melting with Fuel Oil." This furnace was described and illustrated in *The Iron Trade Review* of Oct. 31, 1901. In the absence of Mr. Schwartz the paper was read by Geo. C. Davis. We give the following synopsis:

Test heats have shown that in general copper, bronze or brass can be melted in the Schwartz furnace with one gallon of fuel oil per 100 pounds of metal melted. The cost of maintenance of the brick lining, etc., is 25 cents per ton of metal melted. Oxidation of the metal while being melted in the furnace is low. Pure copper has shown a loss of 2-10 of 1 percent loss. The small oxidation is due to the control of the different kind of flames—oxidizing flame, neutral flame, reducing flame and carburizing flame. When melting copper or bronze a neutral flame is kept in the furnace. The different flames are judged by the flame that escapes from the spout of the furnace. When melting yellow brass a reducing flame is used which prevents oxidation of the zinc. A saving can be made when melting copper, bronze or brass since no crucibles are used. There are no ashes to cart away, no coal or coke to handle, and no metal is lost in the ashes. From 400 to 1,500 pounds of copper, bronze or brass can be melted in the No. 3 furnace in one hour.

Metal from a mixture consisting of 90 percent common No. 2 pig iron and 10 percent of soft steel scrap has stood a transverse breaking strain of 3,780 pounds, the metal being soft, clean and close grained. Semi-steel or gray iron when melted in the Schwartz furnace does not take up any sulphur or phosphorus as iron does in a cupola. Semi-steel or gray iron in 1,200-pound charges in the No. 3 furnace can be melted very fluid in one hour. A 3-ton furnace is now being built which will show a lower cost in production. The No. 3 furnace, which consumes one gallon of oil to 100 pounds of copper, melting at 1,950 degrees Fahr., on semi-steel or gray iron, consumes 1.3 gallons of oil per 100 pounds of metal melted. The cost of maintenance, etc., on the No. 3 furnace for semi-steel or gray iron is 30 cents per ton of metal melted. Greater production and lower maintenance cost can be had with the larger size furnace, No. 4.

Malleable iron is made advantageously in this furnace, the metal not taking up any sulphur or phosphorus. Malleable has been made in the Schwartz furnace in one and one-half hours, the mixture consisting of 35 percent malleable Bessemer pig, 50 percent of sprues and gates and 15 percent of soft steel scrap. A large saving can be made over the air furnace of today, with a No. 4 Schwartz furnace, on account of rapidity of melting and the low melting and maintenance cost. Space is also saved and the comfort of workmen is increased.

A number of steel heats have been made in the Schwartz furnace. The steel charges consist of 40 percent low phosphorus pig and 60 percent of soft steel scrap. The time taken to make a 1,200-pound charge of steel was one hour and fifty minutes, the furnace being hot when charged. The No. 3 furnace was used. The product was .40 percent carbon steel which went into the castings.

The Hawley Down Draft Furnace Co. is now building a No. 4 Schwartz furnace to make all of its gray iron, steel and semi-steel castings, doing away entirely with its coke cupola. Test heats of melting enamel for bath tubs, etc., have been made successfully. Glass and ores of all kinds can be treated. The heat that can be obtained in this furnace is over 4,000 degrees Fahr.

There was no discussion of the paper. Out of respect for the memory of the late president, Mr. Rankin, the proceedings of the meeting were curtailed and the usual lunch abandoned.

The Alleghany Ore & Iron Co.'s furnaces and mines are the subject of an elaborate pamphlet issued by Rogers, Brown & Co., selling agents. The properties owned and operated by the Alleghany Ore & Iron Co. are the Alleghany furnace at Iron Gate, Va.; Buena Vista furnace, Buena Vista, Va.; Gem Furnace, Shenandoah, Va.; Victoria Furnace, Goshen, Va., and the Oriskany, Potts Valley and other mines. Sepia prints give views of the furnaces and iron mines, and the letter press is an interesting description of the company's development in Virginia, the mines being described by W. W. Taylor, the general superintendent. Analyses of the various pig irons of the company are given. That of the Buena Vista basic shows .61 silicon, .019 sulphur, 1.65 manganese, .30 phosphorus, .90 combined carbon and 3.10 graphitic carbon.

The King Bridge Co., Cleveland, held its annual meeting, April 7. The following officers were re-elected: James A. King, president; H. W. King, vice president; Harley B. Gibbs, treasurer, and Norman C. King, secretary. The directors, who were all re-elected, are James A. King, H. W. King, H. W. Osborne, C. A. Otis, Jr., and Harley B. Gibbs. Reports made by the officers showed conditions of business to be very satisfactory.

The Warner & Haviland Co., 88 Chambers St., New York, recently incorporated with a paid in capital of $25,000, succeeds Warner & Haviland. The officers are: Norman Warner, president; John E. Haviland, treasurer, and Somers Foster, secretary. The company does not intend to build or manufacture, but will confine itself as heretofore to representing manufacturers to the Eastern trade. It will carry stocks of the lines it represents in New York City, and to get larger stock room will move on May 1 to 17 Warren St.

The Consumers' Co-operative Coal, Steel & Iron Co., Chattanooga, Tenn., which is about to be incorporated under the laws of New Jersey, contemplates erecting a blast furnace of 250 tons capacity and other plants in or about Chattanooga. John N. Adams, Chattanooga, is the engineer.

The Wilhelm Telephone Mfg. Co., of Buffalo, has rented the fifth and sixth floors of the Franklin building, on Ellicott St., in addition to its present quarters at 45 Division St. A bridge connects the two buildings.

Dodge & Day, modernizing engineers, of Philadelphia, have been commissioned to report on motor equipment for the Firth-Sterling Steel Co., of Pittsburg.

THE MELTING RATIO.*

BY JAMES A. MURPHY, ERIE, PA.

Many foundrymen have gotten into the habit of talking high melting ratios to such an extent that the more inexperienced proprietors are led to think that their foremen are simply robbing them, when one to six or seven is the rule in their establishment. And yet a better ratio may be impossible to obtain when certain classes of work are to be gotten out properly. I do not believe in saving coke at the expense of castings, but this is just what many foundrymen are doing, and many more have done. A few years ago I saw the efforts of the superintendent of a large Eastern foundry to melt at one to ten, with the natural failure that resulted for the particular class of work he had in hand. During two months of this trial, three steam cylinders weighing over 20 tons each, not to mention many tons of the smaller castings, were thrown out by the machine shop. All this work was lost because of dull iron. There were also many tons lost in the foundry which never passed the drop.

Now there is no doubt at all that iron can be melted at the ratio of one to ten, for certain kinds of castings, and when anyone speaks of melting iron thus, it would be well to pin him down to facts; to ask him whether the coke and iron were accurately weighed; what the height of his tuyeres is from the cupola bottom, the height of charging door, diameter of cupola, and blast pressure; what percentage of pig iron, scrap or steel goes in; whether the pig and scrap were large or of normal sizes; whether coal was used with the coke, and the quality of each; finally, what was the class of work to be poured and the length of time necessary to accumulate enough metal to pour the pieces.

Information of this sort would be useful in making comparisons, even though conditions are seldom alike in any two foundries. One establishment may have a cupola of an improved type while the other would be struggling along with the old time home-made affair. I have on some occasions melted iron cheaper in the air furnace than in the cupola, but it would be folly to assert that the air furnace process is the cheapest. Extra good conditions governing a "heat" in the air furnace or cupola are no criterion by which to judge or guide others.

Here is a heat of 16¼ tons taken off under pretty favorable conditions. The coke was excellent and the pig iron and scrap of normal size. In the first three charges there were 35 percent steel clippings, the other charges ran 50 percent pig and 50 percent scrap. The height of the tuyeres from under side of sand bottom 14 inches. Height of charging door 9 feet, pressure 10 ounces. Bed of coke 700 pounds. First charge 2,500 pounds iron and 200 pounds coke. Each succeeding charge had 2,000 pounds iron until the last, when 100 pounds coke only was used. This was in the summer of 1901.

During the greater part of 1902, I could not melt a 10 ton heat better than 1 to 7.8, and smaller heats often down to 5¾. This was a great reduction from 1 to 9 as shown in the first example mentioned, but the quality of the fuel was responsible for this. Had I kept up my melting ratio, I would have lost many castings, and as these were engine and other particular castings, they had to be sound and perfect in every detail.

I am a firm advocate of economy in our foundries, but believe that in many instances the saving of fuel to give higher melting ratios is equivalent to saving a gill at the spigot to lose a gallon at the bung-hole.

The American Steel Foundries has decided to stop manufacturing cars at its plant at Granite City, Mo., but advises us that it does not intend to remove the machinery and will probably resume the car manufacturing at some future time.

*From the April Journal of the American Foundrymen's Association.

TARIFF DISCUSSION IN ENGLAND.

The British Iron Trade Association held a meeting in London, March 31. E. Parkes, M. P., presided. The chairman said the outlook for trade, especially the iron trade, was not encouraging. The condition of the iron and steel trade had been one of long depression, with an occasional boom. This state of the trade had been ascribed to the manufacturers' own lack of education. Some said the fault lay with the British workmen, but he could say that the best American workmen were no better than the best English mechanics. The only question was whether the latter were not held down by undue restrictions. They would have to face the question that free trade conditions have changed since forty or fifty years ago. Free trade might have been right then, but it was not at all adapted to the present conditions.

Axel Sahlin, who visited the United States in 1901, said he had noticed many changes on the other side. The workingman, who was often a capitalist in a small way, always aspired to improve his social position. He therefore was easier to deal with than those who simply allowed themselves to be led by men who made such leadership their business. He considered the preponderance of the United States Steel Corporation very fortunate for the British and European iron trade. The steel corporation would undoubtedly use every resource to maintain prices at something like the present level, at which most British works could undersell the American product both at home and in the colonial markets.

Southern Supply and Machinery Dealers.

The annual meeting of the Southern Supply and Machinery Dealers' Association opened in New Orleans April 8 with addresses of welcome by President C. B. Jenkins, of Charleston, S. C., and John C. Christopher, of Jacksonville, Fla., to which responses were made by Mayor Paul Capdevielle, of New Orleans, and Edwin Parkhurst, of New York. Routine reports occupied the afternoon of Wednesday and will continue Thursday; and on Friday, in a joint session of dealers, manufacturers and their representatives there will be an open discussion of the policy of the association, which is the promotion of friendly business relations among the members and with the manufacturers, the promotion of the commercial interests of Southern supply and machinery dealers, and to assist the manufacturers in developing their business in the South. Another point of the policy to be discussed is the discouragement of "the manufacturers from dealing direct with the consumer, but if any manufacturer finds it necessary to deal direct with the consumer in order to introduce and create a demand for his goods, he will invoice said goods through some dealer in the territory where the goods are sold."

The London *Economist* publishes a summary of the annual reports of a number of coal and iron companies of the United Kingdom for 1902 and 1901. This summary shows a general decrease in net profits of such corporations. Thus eight colliery companies earned £389,907 in 1902 as compared with £508,211 in 1901, while in 1900 seven of these companies earned £708,008. Dividends paid by eight companies in 1902 were £276,229, against £342,118 in 1901. Returns for nine iron and steel companies showed a decrease in net profits from £1,164,042 in 1901 to £988,506 in 1902, the dividends for the same period showing an increase, however, from £944,480 to £988,586.

The Giddings & Lewis Mfg. Co., Fond du Lac, Wis., which manufactures saw mill machinery, has erected a large foundry building which will double the former capacity of the plant. Through the reorganization of the concern as a stock company, the original owners who gave their names to the company have passed out, but the former name is retained.

A LARGE BLOOMING MILL ENGINE.

An important feature of the extensive improvements now being made by the Tennessee Coal, Iron & Railroad Co. at its steel plant, at Ensley, Ala., is the reversing engines provided to drive the 44-inch blooming mill—one of the largest employed in such service. This engine was built by the Mesta Machine Co., of Pittsburg. A view is given of the complete engine, also of the shaft of this engine, which is hollow forged, and with disc and balance wheel, as shown, weighs 143,000 pounds. A special four-truck car was required to carry it, making probably the heaviest load that was ever taken South over the railroads. After reaching Cincinnati over the Pennsylvania Railroad, the Q. & C. and the L. & N. roads refused to take it over their lines on account of the excessive weight. It finally was taken over the B. & O. Southwest, Illinois Central and other roads to its destination.

Engines of this type are necessarily made very massive on account of the heavy work they have to do. The speed is high for such heavy engines, often reaching 200 r. p. m. for a short period. All moving parts must be made exceptionally strong, at the same time as light in weight as possible, on account of the high speed, thus requiring high grade forgings and use of steel castings instead of cast iron. The stationery parts, such as the main frame, are made very massive of cast iron. The steam cylinders are 55 inches diameter and 66 inches stroke. Piston valves are used to distribute the steam. They work in removable cast iron bushings, and have adjustable packing rings. The steam enters the steam chest and the center and exhausts at the ends of the valve chamber. Branch exhaust pipes connect the ends of valve chambers with exhaust pipes below the floor.

The piston valves are operated by means of a reversing link motion. A triple eccentric is used to drive each link. The two outside sections have the same angular advance and are, in effect, one eccentric. They drive one end of the link. The middle section drives the other end of the link. The arrangement avoids all the side strains on links and eccentrics which are present when two eccentrics drive a link through off-set connections.

The reversing is accomplished by means of a steam operating cylinder, whose piston rod is connected by a pair of links to the tumbling shaft. An oil check cylinder directly in line with the steam cylinder has its piston on the same rod. The valve which distributes steam to the operating cylinder and the valve which by-passes the oil in the check cylinder are on the same stem or valve rod. This rod is controlled through a floating lever, by the operator's lever, and the motion of the operating cylinder piston. The latter motion tends to move the valves to their central position and so bring the operating piston to rest. The motion of the operator's lever has the opposite effect. Thus the operating cylinder piston moves only as indicated by the motion of the operator's lever, and is held rigidly in any position it is placed by the oil check cylinder. The links are absolutely under the control of the operator, who can hold them without effort in any position. When brought to their central position they impart no motion to the main valves and the engine comes to rest. This feature furnishes a means of stopping the engine in the event the throttle valve is deranged and cannot be closed. The engine can be operated, cutting off at any part of the stroke. The valve stem connections, rocker arms and all other parts of the valve gear are substantially constructed, and, where practicable, are furnished with means of adjustment. All non-adjustable bearings have steel pins and bronze bushed eyes. An indicator is provided by means of which the operator can observe from the pulpit the position of the links. The whole valve mechanism is supported on the tie piece between the bed plates.

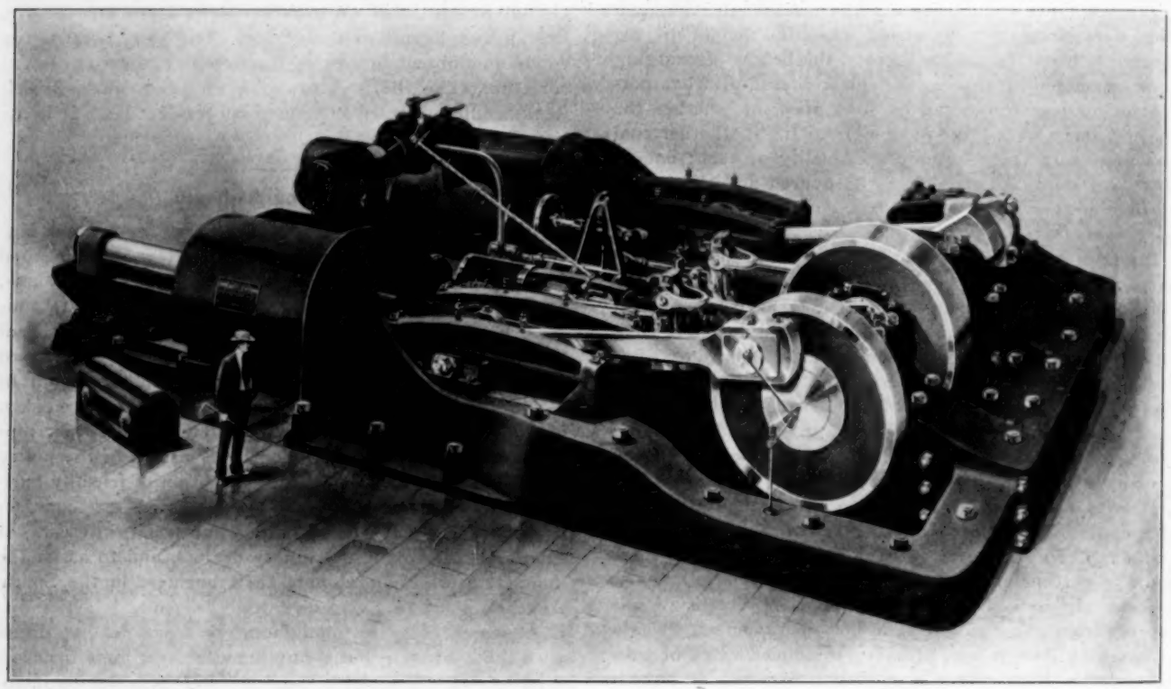


FIG. 1.—A LARGE BLOOMING MILL ENGINE.

This engine when operated under the usual every day conditions will attain, for short periods, a speed of 150 r. p. m. and will develop upwards of 15,000 h. p.

The directors of the American Car & Foundry Co. have declared the regular quarterly dividends of 1¾ percent on the preferred stock and 1 percent on the common stock. The report of the company for the quarter ended Feb. 28, is favorable, showing an increase of $645,466 in net earnings. The total net earnings for the quarter were $1,426,108 as compared with $780,642 in the corresponding period a year ago. For the 10 months ended Feb. 28 the net earning aggregated $5,900,971, as compared with $2,806,118 in the corresponding period in the preceding fiscal year, an increase of $3,184,853.

The Buffalo Forge Co. announces the removal of its Pittsburg offices from 516 Fitzsimmons building to 607 House building, where it will have a large increase of space.

THE METALLURGICAL SECTION OF THE A. F. A.*

BY HERBERT E. FIELD, ANSONIA, CONN.

The various committees of the American Foundrymen's Association have heretofore taken care of the problems which have arisen in connection with the advent of metallurgy into foundry practice. Owing to the increasing demand thus placed upon the association a separate section has been organized to take care of this branch of foundry progress. This section is designed to act as a central exchange for ideas and to direct the advancement of metallurgy in its relation to foundry and furnace practice. Foundry chemistry and foundry metallurgy, like all new movements, have been hampered by insufficient knowledge and by misleading statements made by inexperienced writers. These writers have been without doubt sincere in their opinions, but they have, nevertheless, done immeasurable harm to the advancement of chemistry in foundry practice. They wrote at a time when little was known about the subject and whatever was said was accepted as truth and practiced as such. When the expected results were not achieved, metallurgy was condemned while in reality it was the lack of correct knowledge for its application which was at fault.

Individual chemists have from time to time brought before foundrymen the results of experiments which have proved of great value. These results have, however, lacked the backing which a strong association would have given them, and often passed unnoticed, or, if noticed at all, have been classed with the mass of unreliable matter previously mentioned. This section intends to systematically investigate debated problems and to place before the members for their use the results of these investigations in such a manner as to warrant their acceptance or rejection as correct bases for practical work. There are new propositions continually coming up in this branch of practice which are now slowly and tediously worked out by individual metallurgists in the spare time which they have at their command. The metallurgical section by distributing such work and placing parts of it where it can be most conveniently carried out will be able to greatly expedite these investigations. These problems will be brought before scientific institutions whose equipment and experience in original research will enable them to make a thorough and correct solution of that side of the question. The practical work in connection with the investigations will be done by founders whose equipment is best suited to the matter under consideration. The practical and scientific will thus be combined in a manner which has been much talked of but never accomplished.

Our technical schools are more than anxious to do their part, while foundries are expressing an increasing interest in the work. A strong organization to direct is necessary to complete the success.

Numerous problems arise in regard to iron which cannot be solved by the foundryman. They can only be worked out at the blast furnace. The furnacemen, by their endeavors to find out just what compositions and characteristics are wanted by the foundryman, show that they are alive to the fact that there is much room for study and improvement in their line. The first suggestion for the formation of such a section came from the selling end of the pig iron trade, and this section expects to count blast furnaces among its strongest members.

Chemistry is to have a more useful position in furnace and foundry practice. This is plainly shown by the statement of prominent pig iron and foundry men in the recent issues of trade papers. Agitation in regard to grading, sampling and standardizing indicates the great interest now manifest in this line of work. Progress has been, and will continue to be made, whether such an association is formed to aid it or not. If, however, the labor lost by duplication can be avoided and investigations carried on under the most auspicious circumstances, much greater progress will be made and advancement will be more rapid.

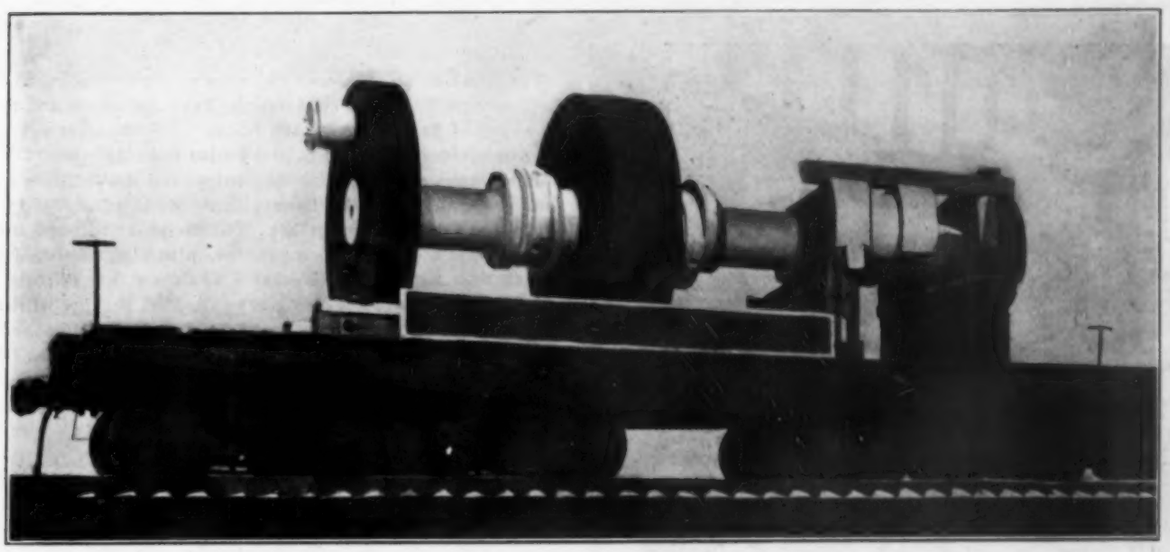


FIG. 2.—THE SHAFT AS LOADED ON SPECIAL FOUR-TRUCK CAR.

The first problem brought before the section for solution is that of standardizing methods for the analysis of iron. The increasing complaint of furnacemen and founders that the analysis of different chemists did not agree, induced the American Foundrymen's Association to refer the matter to its standardizing committee with the idea that this committee could adopt a series of standard methods for iron analyses, and thus obviate the error due to the difference in the methods used. This work has since been referred to the metallurgical section, and the classifying and editing of the various methods now in use are being done by its secretary. The methods sent to the standardizing committee prove that there are many now in use in chemical laboratories which are inaccurate and unreliable. Whether this association adopts a set of standard methods or not, it will point out as inaccurate many methods now in use in iron work.

Many founders are having their analyses made by independent laboratories, and at the suggestion of these founders it was decided to include these laboratories in the list of those who are available for membership in this section. They have shown a decided interest in the work

*Contributed to the April Journal of the American Foundrymen's Association.

and will make a valuable addition to the association, and the metallurgical section will be of great practical value to them.

This section, then, is organized for any who are engaged in the study or practice of chemistry and metallurgy of iron. There is no intention of taking the place of or interfering with the work of any other society. This is a time of specialists. We are, it is true, interested in the work of our fellow scientists in all other lines of work and would be the last to lessen in any way the great good being accomplished by our national scientific societies. There is, however, a crying need in the iron business for an associaton, active, alive, and awake to the conditions and opportunities of the times. An association before which papers may be read? Yes; but an association which will help and educate its members in the metallurgical side of the iron business—an association which, proceeding in a thorough and systematic manner, will investigate and solve problems arising in every-day practice of metallurgy in foundry and furnace work. It is just this place that the metallurgical section is designed to fill, and will fill with credit to itself and to the American Foundrymen's Association, provided it is given the proper support.

THE BROWN CORLISS ENGINE CO.

The Iron Trade Review has had an account of the general features of the plant of the Brown Corliss Engine Co. at

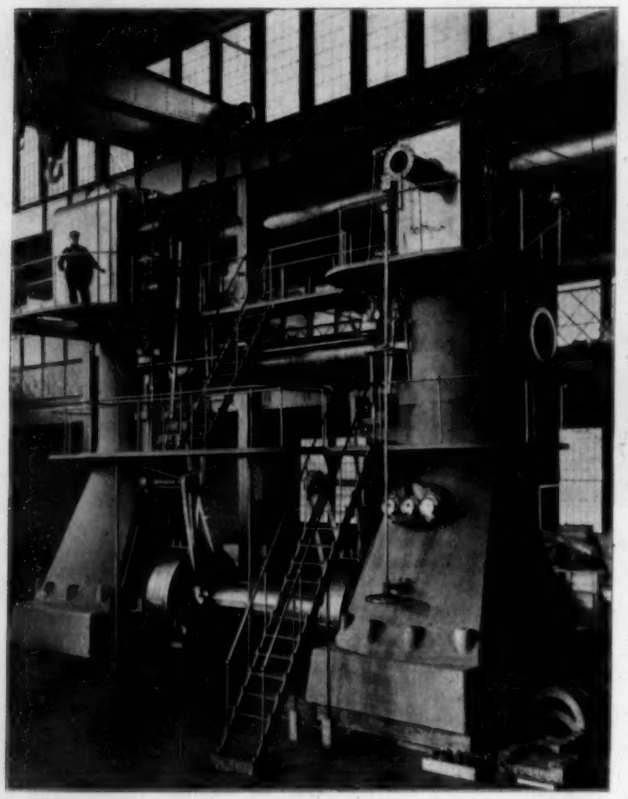


FIG. 1.—A COMPOUND, 32 X 64 X 54-INCH, BROWN CORLISS ENGINE.

Corliss, Wis. This appeared Feb. 6, 1902. The three illustrations now given represent interior views taken in the machine shop. This building is 65 feet in the main span, with a gallery 53 feet wide in the clear. The gallery is made double width and is placed on one side. The machine shop is 440 feet by 118 feet with two 30-ton cranes having a clear lift of 40 feet. There is a 10-ton crane under the gallery floor which runs the entire length of the shop. Lighting has received thorough consideration and a large amount of ribbed glass is employed.

The engine shown in Fig. 1 is a specimen of the work undertaken and is a compound, 32-inch and 64-inch by 54-inch stroke. This is intended for a steam pressure of 150 pounds and 94 R. P. M. The main bearings are 24 inches by 46 inches and the diameter of the shaft in the center is 27 inches. The crank pins are 10½ inches by 10½ inches and the crosshead pins 9 by 12 inches. The flywheel is 21 feet diameter and the total weight of engine is about 600,000 pounds.

The engine is equipped with double eccentrics—separate eccentrics for the steam and exhaust valves. The valve gear is the latest design of Corliss disconnecting type and the cut-off is long range—capable of following to at least three quarters of the stroke. The valves are of the double ported type. The engine has high speed governor and an auxiliary is also furnished, limiting the speed to five revolutions above the normal. The main governor is also provided with an electrical device to change the revolutions of the engine, both above and below the normal so that generators can be brought into step. The engines are throughout of massive design and built for the heaviest class of work. Conover condensers are being furnished with the engines.

The wheel and shaft of one of these engines are shown in Fig. 2, which also illustrates the pit lathe. The latter takes in wheels 32 feet in diameter and 8 feet face. The main bearing on the spindle is 42 inches diameter.

The Brown Corliss Engine Co. has an order for six of these engines—three for the plant of the North Jersey Street Railway Co. and the other three for the Jersey City, Hoboken & Paterson Street Railway Co.

PENDING LABOR QUESTIONS.

The machine molders and founders of the Wyoming and Lackawanna Valleys, Pennsylvania, have agreed on a scale of wages of $2.75 a day of ten hours. The molders asked for a minimum rate of $2.75 and a nine-hour day.

The American Bridge Co. has completed the building of the new bridge over the Pennsylvania Railroad at Thirty-ninth and Spring Garden Sts., Philadelphia, without the aid of union men. The company has also about finished a contract at Schuylkill River and Christian St., Philadelphia, from which union men were called off because of the refusal of the management to grant the conditions asked. In speaking of the statement made in the public press by Frank Buchanan, president of the Bridge & Iron Structural Iron Workers' Union, that 200,000 men might strike, an official of the bridge company said: "As far as we can learn there are probably 10,000 men in the union and there is evidence of this in the fact that the progress of our work has been retarded very little. We never had an agreement, either verbal or written, with the union, so that we could not have violated any promise we made. With us it is not a question of wages, for we are paying the highest wages. It is not a question of hours, for we were the first in the country to reduce the day of labor to nine hours. It is not a question of unions, for we do not care how many unions our men belong to. But it is a question of dictatorial rules which the union officials have made and which they are attempting to force upon us."

The bitter war between the International Sheet Metal Workers' Union and the Sheet Metal Workers' Alliance continues. Representatives of the former now claim that they have discovered a plot on the part of the members of Alliance to kill four members of the union and discourage others from attempting to work in Chicago.

Frank Buchanan, president of the National Association of Structural Iron Workers, visited J. Pierpont Morgan in New York a few days ago. Mr. Buchanan told him that the American Bridge Co. had broken certain agreements with the men, and that among the more serious violations was the employment of non-union labor. Mr. Morgan is said to have told Mr. Buchanan very emphatically that he was opposed to any agreement which would interfere with any man seeking honest employment, and that he did not believe that the attitude of the officers of the iron workers' association toward the bridge company was fair or tenable, and that he would have nothing to do with the matter.

Labor conditions in Chicago are much better than they

have frequently been at this time of the year. The structural iron workers who wanted 60 cents an hour have decided to accept the offer of the organization of their employers, to work for 56¼ cents an hour. This is an increase of 50 cents per day for the 800 men belonging to the union.

Furnace workers have agreed to accept the proposition of the operators in the Ironton district for an increase of 25 cents a day for turn men and 15 cents for laborers. The men had asked 15 percent increase and threatened to strike.

A novel spectacle was presented a few days ago when 27 members of the Chicago Sheet Metal Contractors' Association took the place of striking workmen on an eight-story structure in course of construction. The contractors removed their coats and went to work in earnest, although it was rather hard on their uncalloused hands.

The architectural and structural iron workers of Cincinnati and vicinity, numbering about 350, went on a strike April 1 when their demands for increased wages were refused. They had been getting 33½ cents an hour and demanded an increase to 40 cents. The men returned to work April 6. A scale of wages ranging from 30 to 40 cents an hour and the 9-hour day were agreed upon, to remain in force for 1 year, the union also agreeing to take no part in the sympathetic strikes of the other trades.

Several thousand mechanics employed on buildings in territory between the Bronx River, N. Y., and Hartford, Conn., struck for higher wages April 1. The action of the men has tied up work on a large number of cottages which are in process of construction along the sound by wealthy New Yorkers.

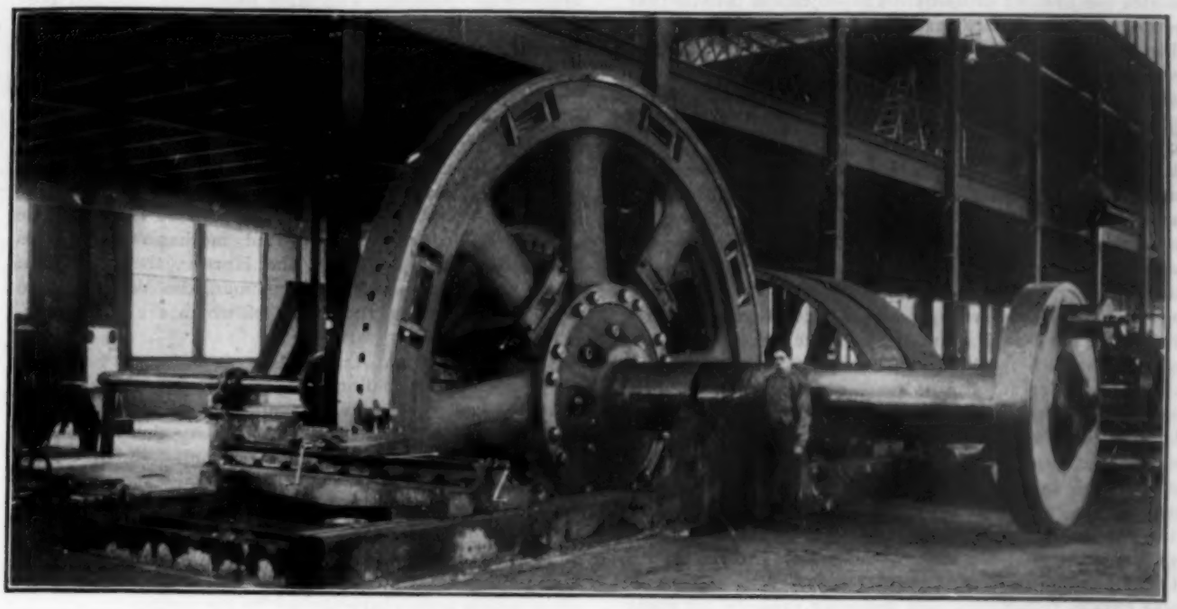


FIG. 2.—PIT LATHE AT BROWN CORLISS ENGINE CO.'S WORKS.

FIG. 3.—VIEW IN ERECTING SHOP OF BROWN CORLISS ENGINE CO.'S WORKS.

TYPES OF BRITISH AND AMERICAN SCROLLCHUCKS.

An amateur can do nearly all the plain work he ever wants to with two chucks, the slotted face-plate and a scroll chuck. A drill chuck is desirable, but if a scroll chuck is fitted with two sets of jaws, one of these sets is suitable for holding drills by. The objection then is that the body of the chuck is rather larger than is convenient when small drills are being used. This, however, scarcely applies to small chucks of 3 or 4 inches diameter, such as most amateurs would use.

A self-centering scroll chuck is open to the objection that it is not capable of holding work of eccentric outline. This, however, can be done on the common face-plate fitted with dogs, and a little eccentricity or irregularity in outline, such as that which is due to the roughness of castings and forgings, can be provided for by inserting a packing bit of paper or metal between one or two of the jaws of a scroll chuck. Thus, though the jaws remain true, the work is thrown out a trifle eccentrically with regard to them. This is, of course, a makeshift method, but it is frequently adaptable to such work.

In the smaller scroll chuck shown in external view in Fig. 1, in sectional and face views in Fig. 2, the rotation of the back or knurled part A in relation to the front or face-plate B, brings the scroll *a* into operation, and moves the jaws C inwards or outwards. In those of small diameter—say of 3 or 4 inches—this movement of the hand applied to the knurled body suffices to grip most work securely, and the lever scarcely needs to be applied to the holes *b*, as it is in the larger sizes. With fair usage, these chucks retain their self-centering capacity for many years. Even though the jaw-threads wear a little slack on the scroll, this does not impair the true centering, because each jaw still travels outwards or inwards the same distance in relation to the others. With chucks of this class, when supplied with two sets of jaws, almost all the ordinary requirements of the amateur are met. As the jaws are easily run back out of their grooves, one set can be substituted for another in about a minute. A hole through the body permits of the insertion of rod, and small tools, or of a bar in a hollow mandrel lathe, provided the chuck is fitted to a face-plate as shown.

The geared universal scroll chuck is an advance on the ungeared scroll of Figs. 1 and 2 in this respect: that instead of using the hand in the smaller sizes, or a lever in the larger to turn the scroll and actuate the jaws, two or more pinions (A, Fig. 3) and a circular rack, B, are employed. When one pinion is rotated by the wrench, the circular rack renders the movements of the other pinions simultaneous and uniform. A better leverage is thus obtained, using a key, and the increased friction due to the teeth also tends to produce a tighter hold on the work.

The evils incidental to, and practically inseparable from, the use of this device are, first, some slight amount of elasticity between the parts, and second, rather serious wear. It is in the attempt to minimize these that we find considerable modification in the geared chucks. To lessen the first, it is essential that the pinions and rack should have ample support, and for the second, that a tough quality of open-hearth steel, and preferably drop forged, be used, and the teeth cut very accurately.

The first named conditions involve making chuck bodies in two or more pieces. In most designs one portion, about half the thickness of the body, is recessed to receive the rack; and one-half of the bearing recesses for the necks of the pinions. The other half takes the other portion of the bearings for the necks, and the screws for operating the jaws. The two portions are jointed through the axis of the pinions. The jaw screws are inclosed and protected within ribs, and these and other ribs help to stiffen the main or front portions of the chuck body. The gears are completely boxed in, and the bearings of their necks come close up to the shoulders of the pinions, in order to eliminate as far as possible springiness of the gears. In this way nearly all that can be done is done to make a snug, well-supported mechanism. This is substantially the design of the Horton, the pioneer of this class of chucks, of the Cushman, the Westcott, and the Skinner chucks, the forms of which are pretty generally known here.

Spring to a slight extent does, however, occur when tightening up one pinion very hard, due to the elasticity of the circular rack, notwithstanding that the latter makes a close working fit in its recess. It is for this reason that full pressure of the spanner for tightening should not be put on one pinion only in lightly built chucks, but on each in succession, after the jaws have been brought into contact with the work. For this reason also some of the later chucks have their circular racks made of considerably stiffer cross-section than they were in the earlier designs, all of which were characterized by flimsiness.

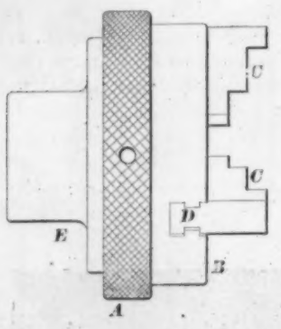


FIG. 1.—SCROLL CHUCK.

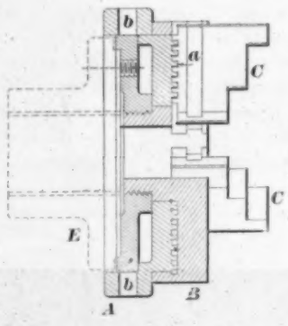
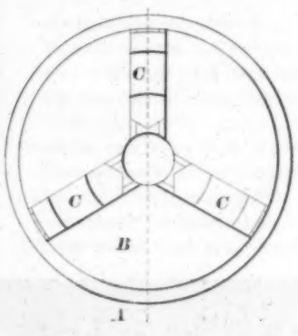


FIG. 2.—SECTIONAL AND FACE VIEWS OF SCROLL CHUCK.



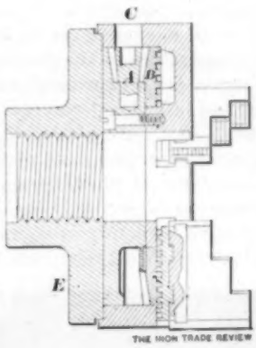


FIG. 3.—GEARED SCROLL CHUCK.

The scroll, or "spiral" chucks, as made by Charles Taylor, of Birmingham, are better designed in this and other respects for heavy duty than the American ones are, being of stronger construction, and better qualified in their design to withstand prolonged wear. In this design, Figs. 4 and 5, which is a type that stands alone, the scroll is cut on a conical surface; hence the designation "spiral" applied to this chuck. This spiral is apparently a little matter, yet it yields several practical advantages over the flat or scroll form. The chuck is also a geared one, having pinions A working in a circular rack, B, the teeth of which are cut directly on the back of the spiral piece. This therefore is not a combination type, but simply a self-centering one. It is, however, free from the objections which apply to the common scroll types in possessing elements of greater durability and better gripping power.

It is rather surprising how great a difference results from the substitution of a steep spiral for a flat scroll. In the latter, the leverage to which the jaws are subjected when gripping work of large diameter is considerably greater than it is in the spiral form, in which the spiral follows the same slope as the jaws do. But the principal advantage is that the gripping pressure takes place normally to the inner face of the screw threads, and these, therefore, receive the strain, similarly to buttress threads, although their sectional forms are of the Whitworth shape.

From this follows the fact that a thread of finer pitch can be used, giving strength equal to that of a coarser thread cut on a flat face. Finer pitch means greater power, and increase in wearing surface. As also the pressure comes normally to one side of the thread, half the surface of the latter is backed up by the solid metal behind.

The illustrations show a large and a small size of the chucks made. One difference in the two is that the larger sizes, Fig. 4, have their pinions A at an angle; in the smaller ones, Fig. 5, the pinion axis is horizontal. The smaller drawing, however, shows a chuck specially designed for brass work, with false jaws, D, screwed to the main jaws C, and having two jaws and two pinions only.

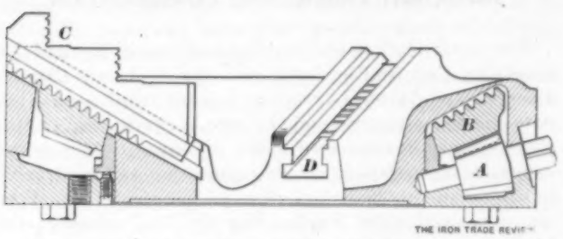


FIG. 4.—SECTION THROUGH LARGE-SIZED TAYLOR CHUCK.

The false jaws D are simply fitted into the shoulders of the main jaws, and there screwed. Any form can then be given to them to suit the work in hand. The method of making such jaws is to turn and drill a ring of the size required, and part it off into segments, in the manner shown in Fig. 6, which shows four jaws parted, and the main chuck jaw dotted beneath. After forming the jaws to the circular shape, they may of course be further cut to V-shape, or other form to suit the work.

The Taylor chucks are made in sizes suitable for amateurs' use as well as for engineers, being as small as 3 inches in diameter. An intermediate face-plate is required, as shown in Fig. 5, to attach them to the mandrel nose. They hold work equal in diameter to their own size.

Turning again to American forms, the combination scroll chuck is a more elaborate piece of mechanism, because it includes devices for changing from universal, or self-centering, movements of the jaws to independent. In

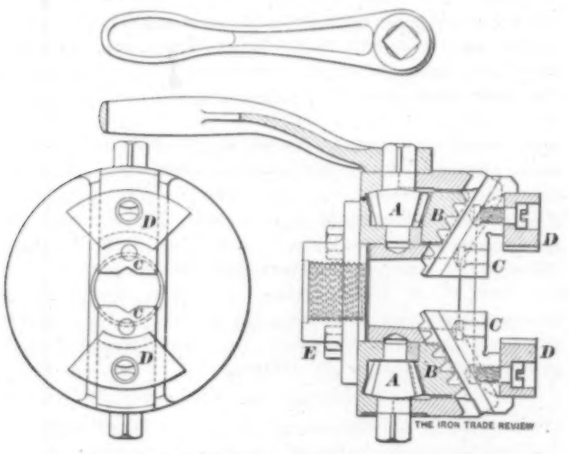


FIG. 5.—TAYLOR CHUCK FOR SMALL BRASS WORK.

other words, provision is made for the ready throwing in and out of the circular rack, or some other equivalent device.

One of the advantages of the combination chuck is that eccentric work can be clamped by the scroll arrangement after the independent jaws have been set to suit the outlines. That, of course, is very well when numerous pieces are all alike and quite true. But when little adjustments have to be made to suit variations in rough castings and forgings, a common dog-chuck or a face-plate gives as little trouble as the combination chucks. These are excellent for some work; but they do not cover all requirements so fully as separate chucks do. Their avowed advantages are, of course, that in one chuck you get a self-centering and also an independent chuck.

What the combination of two classes of movements involves is this: that as the centers of the pinions are necessarily fixed, the rack has to be moved bodily into and out of gear with the pinions, or else separate lever movements are applied to the rack pinions and to the jaw screws. The first is the earlier plan, which is generally retained; the latter is the Whiton design, shown in Fig. 7. In either case, a good deal of complication and many separate pieces are introduced into a small space, which in itself is not desirable. It is only to be tolerated when exceptionally good materials and perfect fitting are embodied, and when the chuck is to be handled by a careful man who will not overstrain the parts. Such chucks are convenient; but all the same, it is generally preferable for engineer's work to have a scroll chuck, and also one with independent jaws, than to combine the two in one body. But the combination form commends itself to the amateur who, perhaps, is only able to afford one chuck, and who will handle it with the greatest care.

In any combination type, facility of effecting the change from self-centering or universal movement to independent is a feature of value. Two movements are common for throwing the circular rack into and out of gear with the pinions—one a simple dropping or lifting of the rack, the other its sliding on an inclined backing or cam ring. The Skinner chuck is of the first kind. Here a stud and nut

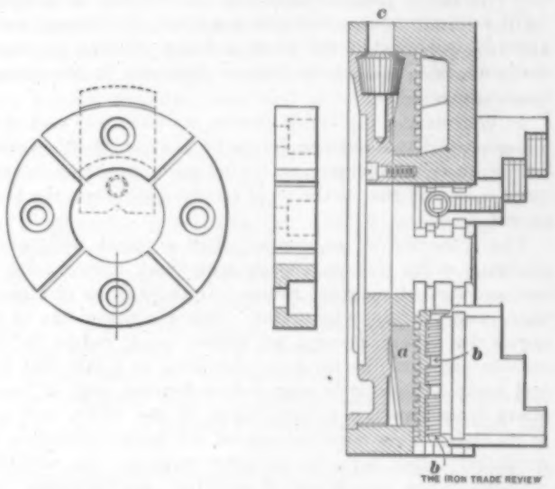


FIG. 6.—MAKING CHUCK DIES.

FIG. 6.—SECTION THROUGH WHITON COMBINATION CHUCK.

effect the change. A plain end on the stud fits a hole in a cam ring lying on the back of the circular rack; a flat piece fits and slides in a recess in the back of the chuck. The stud, in being moved from one slot to another adjacent, turns the cam ring with it, until the cams or projections on the back of the ring fall into recesses in the back of the chuck, and the rack falls out of gear from its pinions. Reversing the action throws it into gear again. In each position a circular nut threaded on the outer end of the stud allows of the clamping of the ring in either position. Before throwing the rack into gear with the pinions, after the chuck has been used independently, the jaws must be set true with the outside edge of the shell.

Other well known chucks embody a sliding movement. Thus, in the Horton combination chuck, four shoes are moved by thumb-nuts up or down inclined planes, so causing them to afford support to a loose ring upon which the annular rack is supported, or to fall away into pockets allowing the ring to drop. In the Westcott, the supporting ring has concave recesses and the cam-plate convex shoes which fall into the recesses to drop the ring and vice versa.

In the Whiton combination chucks, Fig. 7, the circular rack is not dropped out of engagement at all when arranging for independent adjustments of the jaws. The jaws are instead operated through intermediate pieces, *a*, fitting on the scroll at the back. All that is necessary

when working independently is to apply the wrench to the screws, *b*, that move the jaws; and when doing self-centering, to apply it to one of the scroll pinions through the hole C, Figs. 3 and 7, which forms a bearing for the shank of the wrench, and supports the pinion at that end.

It is a pity that the square necks of the pinions and screws stick out beyond the body in nearly all the classes of chucks we are considering, and in other kinds. Firms who have been making chucks for a generation past should have abolished these dangerous excrescences ere now. The danger is, of course, in the shanks catching in the worker's clothes or fingers, with disastrous results. Only some later patterns, like the Whiton, illustrated here, have a square recess in the circular bearing necks of the pinions, and the ends of the screws and keys are inserted in these, so that nothing projects beyond the edge of the body. These recesses are variously made in the shank of the pinion, or in the pinion body, or in the ends of the screws which operate the jaws, these latter screws having holes generally at each end, so that the screws may be reversed when the square is worn badly, and the fresh end used.

There are two types of bodies used in scroll and in combination chucks; the older, made in two parts, united with six screws, one each inserted to right and left of each bearing neck, and the latter, still in two, but having the outside portion in one with the face, and the back portion recessed into this, and screwed, as in Figs. 3 and 7. The latter accords best with one's ideas of solidity. In the former, a great deal depends on the screws, since the two portions of the body are not checked or registered together with a shoulder. But this is the design generally retained.

In considering the scroll chucks we have not said anything specially about the forms of jaws used, respecting which many problems arise. One point only can be noticed now, and that is the wear on the grooves at the back of the jaws.

The difficulty is, of course, that a spiral with ever-changing radius has to engage with jaws having tongues and grooves of constant radius. If these fit in one place they cannot fit anywhere else. Hence a mean has to be struck by giving a curve of rather quick radius to the outside edges of the tongues. Looking at a jaw that has had some service, it is seen that a bearing only is taken along from one-half to two-thirds of the curve, and not at its ends. This does not appear as though favorable to durability. But here, as in other matters, the unlikely happens, when excellence of material, workmanship, fitting, and care in use are combined. Good casehardening is an element which conduces to long life. Another is the exclusion of all grit from the scroll and jaws by their complete inclosure. Another is the taking apart at intervals, wiping, and oiling it. Another is never to overstrain when tightening it up—a wrench of greater length than that supplied with the chuck should not be employed. Slight slackness due to wear, provided there is no overstrain and spring, count for little, because all the jaws wear alike, and the backlash is taken up by the tightening pressure occurring on the outer edges or the inner edges of the tongues in each jaw.

It must not be forgotten that the tongued grooved fitting of the jaws to the chuck-body, seen best in Fig. 1 and in Fig. 4, D, helps the scroll teeth materially by relieving these of much strain due to leverage. As these parts are hardened, and have large surfaces, they do not wear much throughout the life of the chuck.

In a well-made chuck, nothing can move away from the place in which it is coerced, and leverages and elasticity are thus reduced to a minimum. Pinions and their bearing necks and circular racks are snugly inclosed, and jaws are rigidly coerced.

The fitting of the face-plates to the chucks is seen at E, in Figs. 1, 2, 3 and 5. It is only permissible to fit the plate to the flat surface, and the shoulder to the chuck, as seen in the illustrations. The plates are turned upon their own mandrels, and the chuck must never be touched with a tool, or the accuracy will be impaired. The screw holes in the face-plate must be drilled accurately to suit those already in the back of the chuck, and the screw bodies should go in without straining, or the chuck may be distorted slightly.

The smallest chucks, and also the drill chucks proper, are mostly fitted with a taper plug, instead of a face-plate, for which they are too small. The only disadvantage of the plug fitting is that it occupies the hole in the mandrel, and prevents rods from being passed through. For a true drill chuck this is of little moment.—[English Mechanic.

IMPORTANT ENGINEERING CONSOLIDATION.

The consolidation of the Wellman-Seaver-Morgan Engineering Co., of Cleveland, and the Webster, Camp & Lane Co., of Akron, O., was announced April 4, on which date the consolidated company, the Wellman-Seaver-Morgan Co., was incorporated under the laws of Ohio with a capital of $3,000,000 to do an engineering and contracting business, and to manufacture iron and steel. The Wellman-Seaver-Morgan Engineering Co. has recently completed a very extensive plant in Cleveland, of which a description was published in *The Iron Trade Review* on August 7. The specialties of the company are Bessemer and open-hearth steel plants, rolling mills and machinery, metallurgical furnaces, steel buildings, ore and coal handling machinery, coke ovens, etc.

The Webster, Camp & Lane Co., in addition to its original plant, which has been extended from time to time, has a modern plant at Akron, O. It makes a specialty of mining machinery, including hoisting and ore handling machinery. The new company will operate both of the plants. In the handsome new office building which is now being erected at the plant of the Wellman-Seaver-Morgan Engineering Co. in Cleveland the general offices of the two companies will be located, as will also the engineering departments. Steel castings and patterns for the two companies will be made at the Cleveland plant, and the gray iron castings will be made at Akron. The two plants are well adapted to work together. Both are being operated to their full capacity and extensive additions will be made. The new company will control the Wellman patents which have been such an important factor in open-hearth furnace operations, and the Hulett patents, which have done so much to advance methods of handling ore, coal and other material. The Cleveland concern will be known as the Wellman-Seaver-Morgan Engineering Division, and the Akron concern will be the Webster, Camp & Lane Division of the Wellman-Seaver-Morgan Co. The plant of the Webster, Camp & Lane Co. was described in *The Iron Trade Review* of Nov. 6, 1902. The officers of the new company are as follows: President, S. T. Wellman; chairman of board of directors, John McGregor; first vice president, S. H. Pitkin; second vice president, John W. Seaver; third vice president, George H. Hulett; general manager, Charles H. Wellman; secretary, Thomas R. Morgan; treasurer, Albert D. Hatfield.

Hon. George W. Crouse, of Akron, and H. P. McIntosh, of Cleveland, were on April 4 appointed receivers of Aultman, Miller & Co., Akron, O., manufacturers of mower and reaper machinery. The appointment of receivers was made upon application of President Crouse, of the company. The assets as fixed by an audit committee Dec. 31 were $1,751,650, which was about $134,000 short of the liabilities as given at that time.

The mining property of the Lady Ensley Coal & Iron Co. has been sold to the Sloss-Sheffield Steel & Iron Co. for $500,000. The affairs of the Lady Ensley Co. have been in litigation for a number of years and the sale was conducted by order of court. The Sloss-Sheffield Co. has been the lessee of the greater part of the Lady Ensley property, which included coal and iron ore lands in Jefferson, Walker, Fayette, Franklin and other counties in Alabama.

PERSONAL

John Chappell, vice president of the New Castle district of the Amalgamated Association and a roller in charge of one of the tin mills of the American Tin Plate Co., has been appointed to a position in the bureau of statistics of the latter company. Robert Garvin has been appointed to succeed Mr. Chappell as vice president of the New Castle, Pa., district of the Amalgamated Association.

Guy R. Johnson, formerly superintendent of the Duquesne furnaces of the Carnegie Steel Co. and latterly in charge of the blast furnaces of the Illinois Steel Co. at Joliet, Ill., has been appointed superintendent of the furnaces at the South Chicago, Ill., plant.

I. W. Jenks, general manager of the American Steel Hoop Co., with headquarters at Youngstown, O., left this week, accompanied by his family, on an extended tour of England and France.

Officers of the American Sheet Steel Co. last week inspected the company's properties in Ohio and Indiana. The party included the following: W. P. Bache, assistant to President McMurtry; John Warner, general manager; E. W. Pargney, general manager of the Vandergrift plant; A. Davis, superintendent of the Vandergrift plant; P. F. Smith, general manager of the Wellsville and Wood mills; F. D. Brookman, superintendent of the Wellsville plant; Robert Skemp, superintendent of the Scottdale plant; F. M. Cooper, superintendent of the Wood plant; S. B. Ely, chief engineer of the company, and R. A. McKinney, purchasing agent.

S. W. Watkins, president of the Christensen Engineering Co., Milwaukee, and re-elected president of the National Metal Trades Association at the Buffalo meeting, sailed for Europe last week.

W. N. Cliford, engineer and salesman for the International Steam Pump Co., severs his connection with the Pittsburg office to assume a similar one in New York City.

E. E. Bushnell, mechanical engineer at the Minnequa Works of the Colorado Fuel & Iron Co. at Pueblo, Col., has resigned. He removes to San Francisco to engage in business for himself.

Guy L. Andrews, for the last year in charge of the Pittsburg office of the Nonpareil Cork Co., has resigned his position to enter the employ of the International Steam Pump Co. as salesman, being connected with the Pittsburg office.

Robert H. Jeffrey, general manager of the Jeffrey Mfg. Co., Columbus, O., was elected mayor of Columbus at the April election.

Gus F. Meehan, a son of James Meehan, formerly general manager of the Ross-Meehan Foundry Co., Chattanooga, Tenn., has been made general manager and James Meehan has retired from business.

E. L. Morris has been appointed secretary and treasurer of the Sloss-Sheffield Steel & Iron Co., effective April 3, to succeed J. W. McQueen, elected to the second vice presidency. Mr. Morris has been with the company nine years.

Ambros Beard denies the report that he has accepted the position of vice president and general manager of the Cambridge-Byesville Steel Co., promoted by Lakin C. Taylor, of Cambridge.

At a meeting of the board of directors of the Consolidated Lake Superior Co., held in Philadelphia a few days ago, Cornelius Shields was elected president to fill the vacancy caused by the resignation last December of F. S. Lewis. Theodore C. Search has retired as vice president, but will retain his seat in the board of directors. Edward H. Sanborn, formerly general manager of the National Association of Manufacturers, but recently assistant to the president of the Consolidated Lake Superior Co., will succeed Mr. Search as vice president. W. P. Douglas has resigned the offices of secretary and assistant secretary.

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of their Wants:—

The Ashland Steel Range & Mfg. Co., of Ashland, O., has been incorporated to manufacture and deal in steel ranges. , Capital, $100,000. Incorporators: Gustav Ott, W. C. P. Ott, Frank Wharton and C. W. Landis, all of Ashland, O.

The Union Motor Co., Portage, O., capital $15,000, has been incorporated by Chas. B. Rush, Howard C. March, Samuel R. Light, Charles M. Caldwell, Alva Shroyer, Mason Pultz and Alvin March. It will make gasoline engines, etc.

The Morgantown & Kingwood Railway Co., Morgantown, W. Va., has contracted for construction of machine shops, engine house, track scales and yards.

The Moncrief Furnace & Foundry Co., Atlanta, Ga., wants second-hand lathe, power punch and drill press.

Bedford City, Va., will purchase compound engine of Corliss type 150 to 175 horsepower for use in electric lighting plant. J. A. Clark is chairman finance committee.

The Dixon Machine Co., Dixon, Ill., has been incorporated with a capital of $5,000. The officers of the company are: President, C. E. Gardner, Rochelle; vice president, J. F. Schlenning; superintendent, Howard Pike; secretary and treasurer, Phil Miller. The company has a machine shop, warehouse and offices, and will manufacture a corn shredder; also deal in new and second-hand engines.

The Martineau Co., Ltd., Quebec, Que., has been incorporated with a capital of $50,000 to manufacture and deal in iron work.

The Foundry Specialties Co., Ltd., Toronto, has been incorporated with a capital of $40,000.

At the Treasury Department, office of the supervising architect, Washington, sealed proposals will be received until 3 o'clock p. m., May 5, for the construction (except heating apparatus) of the extension of the U. S. court house, postoffice, etc., at Greensboro, N. C.

The C. Rossler Mfg. Co., Buffalo, has been incorporated with a capital of $60,000 to manufacture motors and machinery.

Fayetteville Woodenware Co., Fayetteville, N. C., is in market for new 100 or 125-h. p. boiler.

J. E. McGuire, Wharton, Texas, wants new or second-hand 100-h. p. tubular boiler.

The Powhatan Lime Co., Richmond, Va., wants second-hand 50-h. p. engine, 60-h. p. return tubular boiler.

The Grand River Metal Works, of Galt, Ont., has been incorporated with a capital of $40,000 to manufacture hardware and gas engines.

The Benrici Rotary Piston Co. has been organized at Portland, Me., to deal in machinery. The capital stock is $5,000,000, of which $500 has been paid. The organizers are: Albert D. Bosson, Chelsea, Mass.; Henry L. Whittlesey, Newton, Mass.; Thornton Parker, Boston; Millard W. Baldwin, J. E. Manter, Portland. Henry L. Whittlesey is president and Thornton Parker treasurer.

The Massillon Foundry Co., Massillon, O., has been incorporated with a capital of $10,000 by Wm. R. Harrison, Edward Hagy, Frank G. Harrison, H. P. Harrison and Charles E. Harrison.

The Steam Shovel Co., Toledo, capital $20,000, has been incorporated by Joseph N. Ricard, Joseph Tarault, Wm. S. Russell, Arthur B. Laskey and Chas. A. Russell. It will make steam shovels and dredges.

The Millmine Iron & Steel Co., Toledo, has been incorporated with a capital of $60,000 by Henry B. Millmine, John M. Skinner, Alfred Millmine, Philip Metzger and Wm. E. Cordell. A general metal work will be done.

J. B. Johnson, Chas. H. Dittmer and H. P. Fogh have organized the Union Iron Works, 1602 Railroad Ave.,

Seattle, Wash. The firm will make a specialty of erecting marine engines and machinery.

The United States Foundry & Supply Co., Chicago, has been incorporated with a capital of $100,000 to do foundry, manufacturing and metal work.

The Nebraska Foundry Co., Omaha, Neb., has been incorporated with a capital of $3,000.

The Southern Pipe & Foundry Co., Birmingham, has been incorporated with a capital of $35,000 by H. T. Beggs, J. J. Beggs and J. P. Beggs of Birmingham, and S. F. King, L. L. Hackney and J. P. Hackney of Charlotte, N. C.

The Burger Iron Works & Wire Works Co., Akron, O., has increased it capital stock from $10,000 to $25,000.

The Lancaster Boiler Works, Lancaster, O., has been incorporated with a capital of $25,000.

The Chicago Caloric Engine Co., Chicago, has been incorporated with a capital of $28,000.

The Continental Equipment Co., New York, has been incorporated by McKinley Royle, H. Dolton Newcomb and Benjamin T. Gilbert, New York, to deal in all kinds of machinery and fixtures; capital, $60,000.

The Matchless Gas Engine Co., Indianapolis, has been incorporated with a capital of $10,000.

The Buxton Pump & Iron Works, Nashville, Tenn., has just been organized with a capital of $250,000. The officers are: A. C. Buxton, president; C. A. H. Hough, treasurer. Residents directors are L. E. Lentz, C. A. Hough, A. C. Buxton.

The Buffalo Pitts Steam Roller Works, Buffalo, has increased its capital stock from $125,000 to $200,000.

The H. T. Cook Machine Co., Ansonia, Conn., has been incorporated with a capital of $8,000.

The Kenton Iron & Steel Co., Covington, Ky., has been incorporated with a capital of $50,000.

The Lakeside Malleable Castings Co., Racine, Wis., has been incorporated with a capital of $75,000.

The United States Heater Co., Detroit, Mich., has increased its capital stock from $100,000 to $200,000. It is understood that the company will manufacture radiators.

The Bromley Foundry Co., Albion, N. Y., has been incorporated with a capital of $10,000.

Fires and Accidents:—

The recent fire in the plant of Wickwire Bros., Cortland, N. Y., was of slight consequence, as it did not interfere with the working of the plant.

The plant of Hetherington & Berner, Indianapolis, was damaged by fire March 28. The architectural or structural department and the foundry were uninjured. The pattern-making shop was put out of business for a while on account of damage to machinery and building. Patternmaking work has been shifted to another part of the works and is going on about as usual. The machine department is not under roof, but line shafting and machinery were not greatly damaged and are now in operation again. The fire was out at 6:30 A. M. and at 6 P. M. complete offices were established in an adjoining building. On the morning of March 30, the machinery was in operation. The insurance company allowed damage of $10,000 which was accepted. The firm lose considerably on patterns in store and this loss will require time to replace. The plant is now in operation and customers are being taken care of as usual.

The car shops of the Ontario & Western Railroad, Norwich, N. Y., were damaged by fire to the extent of $9,000, March 31.

Fire totally destroyed the foundry of the Bates Machine Co., Joliet, Ill., April 4, entailing a loss of $50,000, partially insured. The pattern warehouse, containing $100,000 worth of patterns, and the machine shop were saved.

New Construction:

The Robinson-Tilton Machine Co., Columbus, O., will erect a brick machine shop at a cost of $3,000.

Preparations are being made for building a large addition to the Great Northern Railroad car shops at St. Cloud, Minn. The new plant will be devoted to the manufacture of box cars.

Contracts for the construction of the new buildings of the Smalley Motor Co., Ltd., Bay City, Mich., have been awarded. The main building will be 200x50 feet, and there will be a foundry 125x50 feet.

The Passaic Steel Co., Paterson, N. J., has let contracts for the building of two open-hearth furnaces. It is the intention of the company to build eight furnaces in addition to those for which the contract has been let.

The Warren Sheet Metal Co., Warren, O., will soon begin the erection of the following buildings: Power house, 34x47 feet; machine shop, 42x108 feet; galvanizing department, 30x60 feet; warehouse, 46x108 feet.

The Litchfield Foundry & Machine Co., Litchfield, Ill., is arranging to double the capacity of its machine shops. A large addition will be built to the main building which was erected in 1892.

Work has been started on the new plant of the Chicago Heights Malleable Iron Co. The main building will cover 80x350 feet, and the plant will give employment to about 250 men.

E. T. Schuler, president of the Alabama Steel & Wire Co., has announced that the company will build a plant for the manufacture of soil pipe in or near Gadsden, Ala.

The Somerset Pump Co., Somerset, Pa., recently incorporated, is erecting a building which it expects to equip with up to date machinery.

The shops of the Illinois Central in South Memphis, Tenn., costing $400,000, have been completed. They will be used for repair work and the building of locomotives.

The Southern Steel Works, Chattanooga, Tenn., will build an addition for doubling capacity of its plant; cost of improvements $25,000.

The Houston & Texas Central Railroad, Jeff N. Miller, general manager, Houston, Texas, will enlarge its machine shops at Ennis, Texas.

The Chicago Railway Equipment Co. will build a plant at Delray, Mich., for the manufacture of pressed steel car bolsters. The new building will adjoin the new brake beam plant, which manufactures the brake beams formerly turned out by the Monarch Brake Beam Co., of Detroit, and the Sterlingworth Co., of Easton, Pa., both of which were absorbed by the Chicago company a few months ago. The new building will be 60x300 feet.

The Frankford Steel Works will erect three buildings at Franklin, Pa.; namely, a melting shop 60x120 feet, a hammer shop 50x50 feet, and a producer house 24x51 feet.

The twenty acres recently acquired by the Cincinnati, Richmond & Muncie Railroad Co. on the Wabash River, west of Peru, Ind., are being improved preparatory to the erection of shops.

The Malleable Iron Co., of Wilmington, Del., has begun work on its new plant in South Wilmington. The first buildings to be erected will be a substantial office and the main building which will be 320x70 feet. These buildings will be followed by others, and the entire plant will cover about ten acres.

The Cincinnati Milling Machine Co., Cincinnati, will build a two-story addition to its plant, 117x41 feet.

The excavation for the machine shop, foundry and office of the Smalley Motor Co., Bay City, Mich., has been completed, and the contract for the buildings has been let.

Ground for the new plant of the South Atlantic Car & Mfg. Co., Waycross, Ga., has been broken. The following officers have been elected: George Dole Wadley, president; W. A. Price, vice president; F. H. McGhee, second vice president and general manager. The directors are G. R. Youmans, J. S. Bailey, W. A. Price, George Dole Wadley, Warren Lott, H. Murphy, L. Johnson, A. Sessoms, W. W. Beach, J. R. Bunn, J. M. Cox, F. H. McGhee, J. H. Redding, P. N. Harley, Alex. Bonnyman. One hundred thousand dollars has been subscribed by citizens of Waycross.

The Ray Automatic Machine Co., Cleveland, whose decision to build a plant at Berea, O., has been noted, has acquired six acres at Berea and will soon begin the con-

struction of its plant. The Osborn Engineering Co. has charge of the engineering and architectural work.

The Berry Foundry & Mfg. Co., St. Joseph, Mo., has let contracts for an addition. The present foundry is 100x100 feet, and 60 feet will be added, making the building 100x160 feet. The company has recently closed a contract for 430,000 pounds of iron columns to be used in the new buildings which are being erected by the government at Fort Riley, Kansas.

Another new building is to be added to the plant of the Poughkeepsie Foundry & Iron Works, Poughkeepsie, N. Y.

The Morgan Electric Machine Co. is building a plant for the manufacture of electric locomotives at East Chicago, Ind. The principal building will be 80x200 feet, one story. It will be equipped with a large traveling crane and other modern machinery.

Preliminary work is being done on the extensive improvements to be made at the plant of the Illinois Steel Co., in South Chicago, in accordance with the improvement program of the United States Steel Corporation. Two blast furnaces are to be built; and on the docks new hoisting machinery will soon be placed, which will increase the capacity of the docks and at the same time decrease the number of employes.

General Industrial Notes:—

The Circleville Lifting Jack Co., Circleville, O., recently incorporated, is at present having the different parts of the "Little Giant" lifting jack manufactured in different places and sent to Circleville to be put together. The steel is rolled and cut in one place, the malleable castings are made in another, the slugs in a third, the spiral springs in another, etc. At a later date a plant for the manufacture of the different parts may be built, but we are advised that it will not be this season. The secretary of the company is Samuel W. Courtwright.

The Bosworth-Holding Co., Cleveland, is now agent for the Hamilton Machine Tool Co., Hamilton, O.

The business of the Richards Machine Co., Atlanta, Ga., recently incorporated, will consist of new and second-hand machinery, mostly woodworking machinery, and iron machine tools.

The Turner, Vaughn & Taylor Co., Cuyahoga Falls, O., has received an order from the Anglo-American Export Co. for chain making machinery for shipment to England.

The Waynesburg Pressed Steel Co., Waynesburg, Pa., has been manufacturing shovels for the past eighteen months, but has recently increased its capital stock and has been remodeling its plant. W. E. Skelton, who is well known to the shovel trade, is now superintendent.

The S. B. Sexton Stove & Mfg. Co., Baltimore, has been incorporated under the laws of Delaware to continue the business of S. B. Sexton & Son, who have conducted in Baltimore a general foundry business, including the manufacture of furnaces, stoves and ranges and ventilating apparatus. The new incorporation has an authorized capital of $350,000. S. B. Sexton, Jr., is president, and owns all the stock except a few shares. The officers besides Mr. Sexton are Messrs. John E. Semmes, vice president; Robert C. Dorr, treasurer; Henry F. Hildebrand, secretary, and James M. Costin, superintendent.

The Portland Iron & Steel Co., which, as previously noted, will rebuild the plant in Portland, Me., burned last fall, has elected the following officers: President, R. H. Boutwell; vice president and treasurer, P. M. Boutwell; secretary, W. S. McGowan, Jr.; clerk, Stephen C. Perry; directors, Henry B. Cleaves, Eben D. Bancroft, R. H. Boutwell, P. M. Boutwell, W. S. McGowan, Jr.

Geo. W. McFadden, formerly manager of the Auburn Foundry, Auburn, Me., has purchased the plant and will operate it with several associates under the name of the Androscoggin Foundry Co.

All steel castings now made by the Colorado Fuel & Iron Co. at the foundry department of its Minnequa Works are of Bessemer steel, and open-hearth castings are bought in the market. A 10-ton open-hearth furnace for steel castings is under consideration.

The Columbian Iron Foundry, Brooklyn, N. Y., has passed into the hands of the sheriff under an attachment granted in a suit to recover $4,558 damages for breach of contract. Funds in the hands of several Brooklyn firms payable to the defendant company have been attached.

The Jones iron mines in southeastern Socorro County, New Mexico, have been sold to the Colorado Fuel & Iron Co. for $60,000 by Professor F. A. Jones, who discovered them. It is said they contain 60 percent of hematite.

Arrangements are being made at Glasgow, Scotland, to amalgamate thirteen Scotch malleable iron companies, with a capital of $6,000,000.

The machinery of the London Rolling Mills, London, Ont., was set in operation for the first time a few days ago. It is announced that finished material will not be turned out of the foundry for some time, but that muck bar will be made.

The Sweet Steel Co., which considered a proposition to move its plant to Oswego, N. Y., will remain in Syracuse. The bankers of Syracuse have agreed to float $125,000 in bonds, and have provided a site for the company which will build a new plant. This result is due to an active campaign waged by the Chamber of Commerce.

The Pratt & Whitney Co., Hartford, Conn., is making special machine tools for shipment to Great Britain.

The Empire International Car Coupler Co., of New York, recently incorporated with a capital of $500,000, is looking for a location for its proposed plant. The company will make a new car coupler which is the invention of J. B. Genin, of St. Albans, Vt. The officers of the company are R. M. Crater, New York, president; John J. Tandy, of the Empire Iron Works, New York, treasurer; A. M. Powell, of the Woodward & Powell Planer Co., Worcester, Mass., vice president. Mr. Powell has asked that the company establish its plant at Worcester, and if it is located in the east it will no doubt be in Worcester. The company has, however, under consideration offers to go west.

The Biscoe Foundry & Machine Co., Biscoe, N. C., which recently increased its capital stock, will in the future in connection with its repair work deal largely in second-hand geared locomotive, boilers and engines, also will add manufacturing engines. At present it does not expect to enlarge plant, but may add some few pieces of machinery later.

The Queen City Machine Tool Co., Cincinnati, recently incorporated, has rented a building and started with a force of 40 machinists to make a full line of shapers. The president is Wm. H. Roach, who has been identified with shop practice for a number of years and is a successful builder of machine tools.

The Toronto Bolt & Forging Co., Toronto, Canada, has secured possession of the McDonnell Rolling Mills at Hyde Park, the consideration being $90,000, and also property at the mouth of the Humber River consisting of twenty acres. The company is not ready to announce its plans for utilizing the newly acquired property.

The Duncannon Iron Co., Duncannon, Pa., put its new rolling mill in operation March 30, giving employment to 150 men.

The F. M. Pease Corporation, at Hegewisch, near Chicago, has been placed in the hands of receivers, Edwin C. Day and Henry L. Wilson. The business of the corporation was to rebuild locomotives and cars. Liabilities are estimated at about $250,000, and the value of the plant and stock is placed at $175,000.

Some further information is at hand in regard to the Seattle Iron & Steel Co., Seattle, Wash., recently incorporated with an authorized capital of $6,000,000. The incorporators are: Homer H. Swaney, M. J. Carrigan, of Port Townsend; E. M. Wilson, Lakeview, Wash.; Jacob Furth, M. F. Backus, Robert Moran, C. D. Stimson, F. S.

Stimson, J. M. Frink, R. Onffroy, Andrew Hemrich, R. R. Spencer, William Pigott, J. W. Clise, C. L. Denny, J. A. Moore, James D. Hoge, Jr., A. J. Blethen, A. S. Kerry, Maurice McMicken, John Davis, K. Gottstein, J. D. Lowman, Samuel Rosenberg, R. E. Cosgrove, A. L. Brown, W. P. Trimble, Isaac Cooper, Sherwood Gillespy and D. E. Frederick, of Seattle, and William Price, of Port Townsend. The first twenty, with R. J. Stoney, Jr., of Pittsburg, formed the first board of directors. It is stated that the company proposes to issue bonds to the amount of $1,000,000. The plans call for the erection of a blast furnace, which will have a capacity of 150 to 200 tons of pig iron per day. The steel making plant will at the outset consist of two open-hearth furnaces. The third portion of the plant, on which it is announced work will be begun soon, is a rolling mill. It is further announced that after the erection of the first plants, the company will consider plans for the building of a tube pipe works and a tin plate mill. It is stated that work on the first plants will be started early in the summer.

The Pittsburg District:—

The firm of James Bonar & Co., Inc., has been incorporated under the laws of Pennsylvania with $75,000 capital and has taken over the business of James Bonar & Co., dealers in steam specialties and supplies. The new company is building a modern machine shop and brass foundry at 40th St. and A. V. railroad. The capacity of the machine shop will be sufficiently large to take care of all the work required in the manufacture of the many steam specialties handled by the company and orders for general machine work will be solicited. One feature of the new plant will be the installation of a high pressure test boiler which will carry a pressure of 200 pounds and over, enabling the manufacture and testing of high pressure work under actual conditions. The main building is to be 50x95 feet. The offices were recently removed from the Carnegie to the Frick Building. James Bonar is president; Reed F. Blair, vice president; Joseph Cawley, secretary, and Geo. C. Semans, treasurer.

J. J. Turner, third vice president of the Pennsylvania Lines west of Pittsburg, awarded a contract last week for the erection of 3,000 steel and wooden cars to the American Car & Foundry Co. The cars are to be delivered this year. It is estimated that fully 30,000 tons of iron and steel will be used in the construction of the cars.

The erection of the Sligo mills at Connellsville, Pa., is progressing favorably and it is believed that the first iron will be rolled about July 1. All the machinery from the old Sligo Mill at Pittsburg is either on the ground at Connellsville or in transit and much of the new machinery ordered will be delivered shortly.

The Standard Scale & Supply Co., of Pittsburg, has closed negotiations for the purchase of a large site at Beaver Falls, Pa., and will shortly commence the removal of its plant at Bellefonte, Pa., to this property. The new plant is also to be equipped with much new machinery and this equipment and the buildings will cost approximately $200,000.

Two mills of the plant of the Canonsburg Iron & Steel Co., Canonsburg, Pa., were placed in partial operation last week, a satisfactory settlement having been reached with the Amalgamated Association to govern the operation of the plant, the regular scale having been signed. The remaining four mills will be placed in operation shortly.

The Pressed Steel Car Co. last week filed its seventh suit against the Standard Steel Car Co., in the United States Circuit Court at Pittsburg, Pa., for alleged infringement of patents. The total damages asked in this suit aggregate $1,000,000. An injunction is also asked. The infringement, it is alleged, was embodied in the cars erected for the Chicago & Alton Railway Co.

The capital stock of the Pennsylvania Airbrake Co., of Washington, Pa., has been increased from $10,000 to $1,000,000. The company is now negotiating for the purchase of a site near Washington for the erection of its plant. Officers of the company have been elected as follows: H. G. Manning, president and general manager; C. N. Brady, vice president; A. C. Warne, treasurer; W. P. Paxton, secretary. The officers, together with J. H. Fisher, F. T. Otley, James Warren, George M. Davis and T. F. Birch, comprise the board of directors.

Frank Felkel, mechanical engineer, has opened an office at room 419 House Building, Pittsburg.

The Kittaning Iron & Steel Mfg. Co., operating a blast furnace on foundry and forge iron at Kittaning, Pa., has opened an office at room 1203, Farmers Bank Building, Pittsburg.

The McClure Co., of Pittsburg, Pa., owner of the Washington Charcoal Iron & Tin Mills at Washington, Pa., has decided to expand its plant by the erection of a large addition in which will be carried on the manufacture of charcoal blooms for use in the plant. The new building will be 75x100 feet. A steam hammer and several puddling furnaces will be installed.

During the month of March the 40-inch blooming mill of the Duquesne plant of the Carnegie Steel Co. rolled 33,500 tons of steel, breaking all previous records by 383 tons. The output of the Bessemer converters was also 300 tons in excess of the best previous record.

Owing to the delay in delivery of structural material to be used on the merchant steel mill and tin plate mill at the Minnequa Works, two hundred and fifty men altogether, including some laborers employed in floating gangs, as well as a few machinists and boilershop men, have been laid off during the last three weeks. All of the preparatory work on foundations, etc., has been completed for the departments mentioned above and the temporary lay off of these men has come as a result of the Colorado Fuel and Iron Co. getting ahead of the delivery of material from the East, and does not in any way indicate any differences in the management or among stockholders. At no time has there been greater harmony than at present. This delay in the merchant steel mill and the tin plate mill, although vexatious, will not interfere in any way with the completion of the enlargements and improvements in other departments.—[Camp and Plant, Pueblo, Col.

A dispatch from Portland, Me., April 2, says that at a special meeting of stockholders of the Mohawk Valley Steel & Wire Co. held there it was voted to increase the capital stock from $25,000,000 to $60,000,000. The dispatch says that the company was organized three months ago by New York capitalists and is building a $5,000,000 plant in the South and acquiring iron and coal lands in Southern States. The second of these statements is incorrect. No plant is being built. A scheme is being promoted at Brunswick, Ga., where citizens have pledged aid, but nothing tangible has been done. Incidentally more misstatements have appeared in the press about the plans and so-called operations of this company in the past few months than about any other enterprise connected with the iron trade.

The Louisville Foundry & Machine Co., Louisville, Ky., has been awarded a contract for the manufacture of the freight elevators for the new station at St. Louis of the St. Louis Terminal Railway Co., which, with the exception of the terminal stations in Boston, Philadelphia and New York, is the greatest terminal freight station in the United States. The contract for the elevators amounts to $90,000. Work on the contract must be completed by August, and the company which will fill the contract has ordered new machinery and will increase the number of its skilled workmen.

Iron ore has been discovered in the property of the Chattanooga Co., Ltd., in Hill City, Tenn. The vein is said to be 3½ feet thick. Several car loads of the new ore have been shipped to local furnaces.